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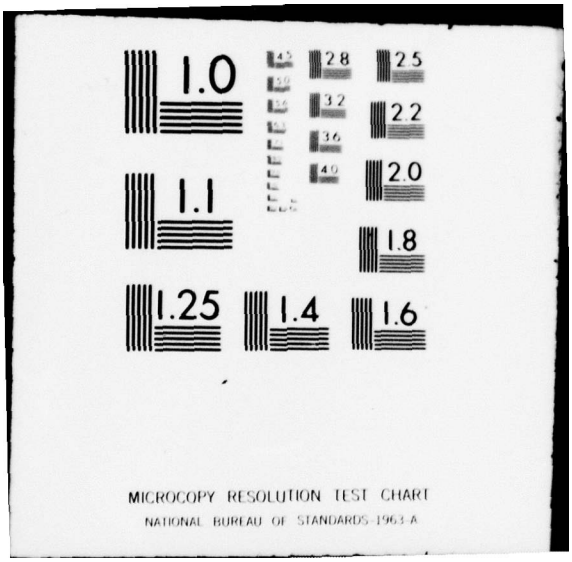
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POST BROOK, PASSAIC COUNTY

NEW JERSEY

POST BROOK DAM

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

NJ 00220

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE - 2D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT. CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA. PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-D

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

28 SEP 1978

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Post Brook Dam in Passaic County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Post Brook Dam, a high hazard potential structure, is judged to be in reasonably good condition. Post Brook Dam, along with Irish Brook Dam (NJ00204), impounds waters which form Lake Iosco. The combined spillways of the two dams are judged to be inadequate since 7 percent of the Probable Maximum Flood (PMF) would overtop both dams. The decision to consider this dam's spillway "inadequate", rather than "seriously inadequate" as stated by the consultant, is based on overtopping of the concrete dam which should cause only minor damage to the dam. The dam's abutments and foundations are massive unweathered rock. To insure adequacy of this structure, the following actions, as a minimum, are recommended:

a. The adequacy of the spillway should be determined by a qualified professional consultant, engaged by the owner, using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway should be initiated within calendar year 1979. In the interim, a detailed emergency operation plan and a warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

b. A program for regularly observing seepage should be implemented within six months from the date of approval of this report.

c. Within six months from the date of approval of this report, the following actions should be initiated.

(1) Brush and vines growing on the downstream face, and decayed vegetation at the toe of the dam should be removed and this area kept clean.

(2) Areas of deteriorated, spalled or seriously cracked concrete should be repaired annually to prevent progressive damage.

(3) Deteriorated stoplogs presently in the sluice inlet, should be replaced.

(4) The owner should initiate a program of annual inspections of the dam, utilizing the standard visual check list in this report. Also, a permanent log should be kept of all maintenance and operating events of the dam and lake.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Robert A. Roe of the Eighth District. Under the provisions of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia, 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely yours,

James G. Ton

1 Incl
As stated

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

Cy furn:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N. J. Dept. of Environmental Protection
P.O. Box 2809
Trenton, NJ 08625

POST BROOK DAM (NJ00220)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 28 June and 6 July 1978 by Harris-ECI under contract to the State of New Jersey. The state, under agreement with the U. S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

The Post Brook Dam, a high hazard potential structure, is judged to be in reasonably good condition. Post Brook Dam, along with Irish Brook Dam (NJ00204), impounds waters which form Lake Iosco. The combined spillways of the two dams are judged to be inadequate since 7 percent of the Probable Maximum Flood (PMF) would overtop both dams. The decision to consider this dam's spillway "inadequate", rather than "seriously inadequate" as stated by the consultant, is based on overtopping of the concrete dam which should cause only minor damage to the dam. The dam's abutments and foundations are massive unweathered rock. To insure adequacy of this structure, the following actions, as a minimum, are recommended:

a. The adequacy of the spillway should be determined by a qualified professional consultant, engaged by the owner, using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway should be initiated within calendar year 1979. In the interim, a detailed emergency operation plan and a warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

b. A program for regularly observing seepage should be implemented within six months from the date of approval of this report.

c. Within six months from the date of approval of this report, the following actions should be initiated.

(1) Brush and vines growing on the downstream face, and decayed vegetation at the toe of the dam should be removed and this area kept clean.

(2) Areas of deteriorated, spalled or seriously cracked concrete should be repaired annually to prevent progressive damage.

(3) Deteriorated stoplogs presently in the sluice inlet, should be replaced.

(4) The owner should initiate a program of annual inspections of the dam, utilizing the standard visual check list in this report. Also, a permanent log should be kept of all maintenance and operating events of the dam and lake.

APPROVED: James G. Ton

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 28 Sep

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Post Brook Dam on Lake Iosco, I.D. NJ00220
State Located:	New Jersey
County Located:	Passaic
Stream:	Post Brook
Date of Inspection:	June 28, and July 6, 1978

Assessment of General Condition

The general condition of Post Brook Dam is good. The general safety of Post Brook Dam is considered "seriously inadequate" because of its lack of spillway capacity to pass the PMF, (the Spillway Design Flood, SDF, for this dam), without overtopping the dam. Post Brook Dam, along with Irish Brook Dam, impound the waters which form Lake Iosco. The spillways of these two dams combined are capable of passing a flood equal to 6 percent of the PMF.

At present the engineering data available is not sufficient to make a definitive statement on the stability of the dam.

The following remedial actions, are suggested along with a timetable for their completion.

1. Studies to augment the spillway discharge capacity should be undertaken within six months.

2. A program for regularly observing seepage should be implemented within six months.

Furthermore, while of a less urgent nature, the following additional action is recommended and should be carried out within a reasonable period of time.

1. Brush and vines growing on the downstream face, and decayed vegetation at the toe of the dam should be removed and kept clean.

2. Areas of deteriorated, spalled or seriously cracked concrete should be repaired annually to prevent progressive damage.

3. Deteriorated stoplogs presently in the sluice inlet should be replaced.

Robert Gershowitz, P.E.

Robert Gershowitz, P.E.

POST BROOK DAM June 28, 1978

View of dam, outlet notch and spillway from left abutment.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

POST BROOK DAM ON LAKE IOSCO, ID. NJ00220

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

The National Dam Inspection Act (Public Law 92-367, 1972) provides for the National Inventory and Inspection Program by the U.S. Army Corps of Engineers. This inspection was made in accordance with this authority under Contract C-FPM No. 35 with the State of New Jersey who, in turn, is contracted to the Philadelphia District of the Corps of Engineers.

b. Purpose of Inspection

The visual inspection of the Post Brook Dam was made on June 28, and July 6, 1978. The purpose of the inspection was to make a general assessment as to the structural integrity and operational adequacy of the dam structure and its appurtenances.

c. Scope of Report

This report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the Field Inspection; presents an evaluation of hydrologic and hydraulic conditions at the site; presents an evaluation as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

1.2 Description of Project

a. Description of Dam and Appurtenances

Post Brook Dam is a mass concrete structure with a maximum height of about 14.5 feet. Section dimensions were obtained from a plan on file with the New Jersey Department of Environmental Protection. The crest width is 3.0 feet; upstream face slopes back at 1 horizontal to 12 vertical; downstream face is vertical from the crest for the first 2 feet, then slopes outward 7 horizontal to 12 vertical. The dam axis is straight. The total length of the dam is 316 feet as measured during the Field Inspection. Freeboard at the time of the inspection was about 1.3 feet.

Bedrock outcrops occur in both abutments and available plans indicate that the dam is founded on rock.

The spillway is a broad crested weir fitted with flashboards. Total spillway length is 59.6 feet with a depth of 17 inches. A notch 24 inches deep was constructed in a 10 foot wide section on the right side of the spillway and functions as a service spillway.

The dam does not have a low level outlet pipe, rather a sluice fitted with flashboards is located about 50 feet from the left abutment. The sluice is 2 feet wide and 6 feet 2 inches deep. Flashboards are 10 inches deep and 2 inches thick.

The spillway discharges into a poorly defined natural channel. The ground downstream of the dam is gently sloped and heavily wooded. The stream bed contains numerous gravels, cobbles and boulders. Four culverts lie beneath the access road downstream of the dam; three 18-inch diameter and one 36-inch diameter concrete pipes.

b. Location

Post Brook Dam is located in Passaic County, New Jersey. It is accessible by way of Doty Road. The dam is on land owned by the Lake Iosco Corporation with private property roadway access.

c. Size and Hazard Classification

Post Brook Dam is classified in the dam size category as being "intermediate", since its storage is less than 50,000 acre-feet and may be slightly more than 1,000 acre-feet. Its size classification based on height is "small" since its height would be less than 40 feet, but the larger size category governs. A hazard potential classification of "high" has been assigned to the project in the National Inventory of Dams and this classification is concurred with because the Field Inspection revealed that a failure of the dam would cause extensive loss of life or excessive property damage.

d. Ownership

Post Brook Dam is owned by the Lake Iosco Corporation, 3 Morse Lake Road, Bloomington, New Jersey, 07403: Attention: Mr. Richard Zuidema.

e. Purpose of Dam

The lake is used only for recreation, mostly swimming, boating and fishing.

f. Design and Construction History

The dam was constructed around 1923, on what is now the east side of Lake Iosco. In 1947, 4-inch flashboards were installed and blow-off pipes were replaced with a sluice. No computations for the design of the original structure were available. No records of the original construction were available. No computations relating to the 1947 modification were available.

g. Normal Operational Procedures

The discharge from the lake is normally unregulated, however, the water level in the lake is very stable. It was reported that the water level is lowered 1.5 to 2 feet each fall. The water level is allowed to return to its normal level each spring by the collection of the natural inflow into the reservoir.

1.3 Pertinent Data

a. Drainage Area - 3.7 square miles

b. Discharge at Damsite

Maximum known flood at damsite	N.A.
Warm water outlet at pool elevation	N.A.
Diversion tunnel low pool outlet at pool elevation	N.A.
Diversion tunnel outlet at pool elevation	N.A.
Gated spillway capacity at pool elevation	N.A.
Gated spillway capacity at maximum pool elevation	N.A.
Ungated spillway capacity at maximum pool elevation	19 cfs (El. 268.8)
Total spillway capacity at maximum pool elevation	19 cfs

c. Elevation (Feet above MSL)

Top of dam	270
Maximum pool-design surcharge	268.8
Full flood control pool	N.A.
Recreation pool (determined by spillway crest elevation at Irish Brook Dam)	267.9
Spillway crest	268.1
Upstream portal invert diversion tunnel	N.A.
Downstream portal invert diversion tunnel	N.A.
Streambed at centerline of dam	255
Maximum tailwater	N.A.

d. Reservoir

Length of maximum pool	4,800 feet
Length of recreation pool	4,600 feet
Length of flood control pool	N.A.

e. Storage (Acre-Feet)

Recreation pool	990 acre-feet (El. 267.9)
Flood control pool	N.A.
Design surcharge	1,056 acre-feet (El. 268.8)
Top of dam	1,137 acre-feet (El. 270)

f. Reservoir Surface (Acres)

Top of dam	75 acres (El. 270)
Maximum pool	74 acres (El. 268.8)
Flood control pool	N.A.
Recreation pool	73 acres (El. 267.9)
Spillway crest	73.2 acres (El. 268.1)

g. Dam

Type	Straight Concrete Gravity
Length	316 feet
Height	14.5 feet
Top width	3.0 feet
Side slopes - Upstream	1 horizontal to 12 vertical
- Downstream	7 horizontal to 12 vertical

Zoning	N.A.
Impervious core	N.A.
Cutoff	N.A.
Grout curtain	None

h. Diversion and Regulating Tunnel (N.A.)

i. Spillway

Type	Overflow
Width of weir	10 feet (Spillway Notch) 59.6 feet (Total Spillway)
Crest elevation	268.1 (Spillway Notch) 270 (Remainder of Spillway)
Gates	N.A.
Upstream channel	Reservoir
Downstream channel	Post Brook

j. Regulating Outlets

Type	Sluice at dam crest
Size	2 feet wide by 6 feet, 2 inches high
Gate Type	Stoplogs
Sill Elevation	264

SECTION 2: ENGINEERING DATA

2.1 Design

No drawings or computations pertaining to original construction, modification or repair of the dam could be found. No foundation borehole or geologic investigation data could be found. The design strength for the mass concrete is unknown. The only available drawings were two drawings dated August 30, 1947, showing the plans for installation of the sluice fitted with flashboards. These drawings are available from the New Jersey Department of Environmental Protection.

2.2 Construction

No records have been found and the owner's representative has no knowledge of the construction history of the dam.

2.3 Operation

No records of operation of the lake are kept by the owner. The only operating rule is to lower the lake each fall to protect boat docks during the winter. Otherwise, the lake is allowed to operate naturally without regulation.

2.4 Evaluation

a. Availability

No engineering data was available for the original section apart from the previously mentioned drawings.

b. Adequacy

While the engineering data was insufficient to perform a comprehensive, definitive evaluation of the dam's stability, an adequate assessment of the dam could be carried out with the data obtained in the field in view of the overall good condition of the dam.

c. Validity

The field inspection appears to substantiate the available plans and sections to the extent that could be determined by visual observations.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection made of Post Brook Dam did not reveal any signs of distress in the dam. The dam appeared to be in reasonably good condition with adequate maintenance.

b. Dam

Moderate concrete spalling has occurred on the downstream face of the dam. Considerable spalling has occurred in the mortar cap placed on the crest. Severe spalling has occurred just above a rock contact at the left end of the dam on the downstream side. Several cracks were observed at through joints, however, the concrete appeared to be strong and sound.

Evidence of a repair to the downstream face was observed 52 feet from the right abutment. The repair is about 16 feet long.

Vines were observed growing up the face of the dam, rooted in cracks.

There were no indications of either horizontal or vertical movement of the structure.

Biotite gneiss crops out on both abutments and downstream of the right abutment. A major joint set parallels the foliation which strikes about N5°W and dips 35°NE. Three mutually perpendicular joint sets vary in spacing from 1 to 2 feet to over 4 feet and appear relatively tight in outcrops.

Records available from the New Jersey Department of Environmental Protection indicate that the dam is founded on rock.

Most horizontal construction joints show evidence of past leakage with the presence of leaching deposits, however, virtually all joints were dry at the time of the inspection. Considerable leakage was occurring from the stoplogs in the sluice. The leakage was estimated at about 20 g.p.m. at the time of inspection. A seep was observed approximately 50 to 75 feet downstream of the dam about midway between the spillway and right abutment. Estimated seepage was about 2 g.p.m. and appeared to be free of fine soil grains.

c. Appurtenant Structures

Spillway

The downstream surface is moderately spalled. Light spalling could be seen on visible portions of the upstream surface. A vertical construction joint, or possible through crack, was observed, however, it was not leaking at the time of inspection.

d. Reservoir Area

The reservoir rim is gently sloped and no indications of instability were readily apparent. The slopes above the reservoir are heavily wooded. No buildings or dwellings are built on or near the shoreline, with only a few boat docks on the shoreline. The property around the lake is privately owned and it was reported that access to the lake is limited to members of the Lake Iosco Corporation.

e. Downstream Channel

The discharge channel is a poorly defined natural brook. There are numerous cobbles and boulders along the channel. Side slopes are gentle with heavy vegetation and tree growth. Numerous dead trees obstruct the channel.

3.2 Evaluation

At the time of the inspection, the dam appeared to be functioning adequately with no apparent signs of distress. The seepage observed does require regular observation. The spillway appears to be in reasonable condition. Abutments appear to be in very good condition. Reservoir slopes show no readily apparent signs of instability and are not believed a potential threat to the safety of the dam.

A further assessment of the dam appears in subsequent sections and recommendations appear at the end of Section 7.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

Post Brook Dam is used to impound water for recreation activities. The policy is to maintain a nearly constant lake level. The lake level is normally maintained by unregulated discharge over the spillways of Post Brook Dam and Irish Brook Dam, both on Lake Iosco.

The lake level is lowered each fall by releasing water through the sluice in Post Brook Dam. The lake is usually lowered about 15 to 18 inches below the normal level, during the winter and is allowed to refill naturally in the early spring. Every 5 to 7 years the lake is lowered to the bottom of the sluice sill for inspection and maintenance of the upstream face. The next inspection is tentatively scheduled for 1980.

4.2 Maintenance of the Dam

There is no program of regular inspection and maintenance of the dam and appurtenant structures. Operation and maintenance is done by the Lake Iosco Corporation. Monthly directors meetings are held. The minutes of these meetings report actions and conditions relative to the dam.

4.3 Maintenance of Operating Facilities

The sluice is the only facility for draining the lake. Operation is every 5 to 7 years as previously noted and maintenance is as needed.

4.4 Evaluation

Surveillance and maintenance is in the hands of the Lake Iosco Corporation. A formalized program of periodic inspection by an experienced party should be initiated and documentation recorded to assist the owner.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

The drainage area above the Post Brook Dam is approximately 3.7 square miles. The drainage area is common to both the Post Brook Dam and the Irish Brook Dam. The two dams impound water in the same reservoir, named Lake Iosco. The Post Brook Dam is located at the east end of the reservoir, and the Irish Brook Dam is located at the south end of the reservoir. The drainage area above the dams was delineated from U.S.G.S. quadrangle topographic maps. A drainage map of the watershed of the two dams is presented on Plate 1, Appendix D.

The topography within the basin is generally hilly. There are some lakes and a few swampy areas at the northeast section of the watershed. Elevations range from approximately 1,190 feet above mean sea level in the hills at the northeast end of the watershed to about 270 feet at the Post Brook damsite.

Land use patterns within the watershed are mostly forest in the hilly sections, and urban around the lakes in the northeast section. The southern portion of Norvan Green State Forest is within the watershed of the Post Brook Dam and the Irish Brook Dam.

The evaluation of the hydraulic and hydrologic features of the Post Brook Dam was based on criteria set forth in the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, and additional guidance provided by the Philadelphia District, Corps of Engineers. The Probable Maximum Flood (PMF) was calculated from the Probable Maximum Precipitation (PMP) using Hydrometeorological Report No. 33 with standard reduction factors. Due to the small drainage area of the Post Brook and Irish Brook Dams, the SCS triangular hydrograph, transformed to a curvilinear hydrograph, was adopted for developing the unit hydrograph. The derived unit hydrograph is presented under the section of hydrologic computations.

Initial and infiltration loss rates were applied using the SCS procedure with the PMP to obtain rainfall excesses. The rainfall excesses were then applied to the unit hydrogrph to obtain the PMF hydrograph utilizing the Corps of Engineers' computer program HEC-1. The computed peak discharges of the PMF and one-half of the PMF are 16,544 cfs and 8,272 cfs respectively.

Both the PMF and one-half the PMF inflow hydrographs were routed through the reservoir by the Modified Puls Method, utilizing the HEC-1 computer program. The spillway and overtop discharge rating curve for Post Brook Dam was combined with the spillway and overtop discharge rating curve for Irish Brook Dam for the flood routing. The peak outflow discharges for the PMF and one-half of the PMF for the two dams are 16,041 cfs and 7,977 cfs, respectively. Both the PMF and one-half of the PMF result in overtopping of both dams.

The spillway and overtop discharge rating curve of the Post Brook and Irish Brook Dams were prepared assuming free overflow across the whole length of the dams the spillways. The reservoir stage-capacity data were based on the U.S.G.S. quadrangle topographic maps in combination with data given in the National Dam Safety Inventory Table. Reservoir storage capacity includes surcharge levels exceeding the top of the dam. The spillway and overtop discharge rating curves of the Post Brook and Irish Brook Dams and the combined spillway and overtop discharge rating curve of the two dams were prepared assuming the dams remain intact during routing. The spillway and overtop discharge rating curves of the Post Brook and Irish Brook Dams and the combined spillway and overtop discharge rating curve of the two dams are presented in Plates 2, 2A and 2B. The reservoir capacity curve is also presented in Plate 3 of Appendix D.

b. Experience Data

No records of lake levels are maintained for this site. The lake level is normally stable, however, it was reported that the dam has been overtopped up to 3 inches during severe storms.

c. Visual Observations

The valley below the dam is heavily wooded with much debris. There are few dwellings immediately downstream of the dam along the periphery of Post Brook. The slopes around the lake are moderate to steep and heavily wooded. There is little evidence of sedimentation in the lake.

d. Overtopping Potential

As indicated in Section 5.1-a., both the Probable Maximum Flood and one-half of the Probable Maximum Flood, when routed through the Lake Iosco reservoir result in overtopping of the Post Brook Dam and the Irish Brook Dam. The PMF and one-half of the PMF overtopped Post Brook Dam by 4.2 feet and 2.6 feet, respectively. In determining the overtopping heights it was assumed that both the dams remain in their present condition, such that outflow occurs over both the dams during the floods, according to the existing structural dimensions of the dams. The spillways of the two dams are only capable of passing a flood equal to approximately 6 percent of the PMF without overtopping the dams. Since the PMF is the minimum Spillway Design Flood (SDF) for Post Brook Dam, according to the Recommended Guidelines for Safety Inspection of Dams by the Corps of Engineers, the spillway capacity of the dam is considered "seriously inadequate".

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

At the time of the inspection the dam did not exhibit any visible signs of distress. There was no evidence of tilting, misalignment or movement on the foundation. The dam is founded on competent rock. The surface spalling and deterioration of concrete does not affect the structural strength or stability. Based on a visual inspection, and in view of more than 50 years of satisfactory past performance, the structure appears to be stable.

b. Design and Construction Data

No design or construction data was available. The only available data are two drawings showing the section, profile and sluice detail for the dam.

c. Operating Records

No operating records were available.

d. Post-Construction Changes

As discussed in Section 1.2, the only known post-construction change was the placing of 4-inch flash boards on the spillway and construction of the sluice fitted with stoplogs.

e. Static Stability

Approximate calculations do not indicate instability against overturning. An adequate factor of safety exists against bearing capacity failure. Resistance to sliding is provided by the soil at the downstream toe of the dam in addition to adhesion between the concrete and bedrock, as well as normal frictional resistance. The degree of adhesion and surface irregularities between concrete and bedrock are unknown, therefore, it was not possible to perform reliable calculations pertaining to sliding. Nevertheless, in view of past performance and with no visual indications of distress, potential sliding is not considered a problem. Stability calculations are shown in Appendix E.

f. Seismic Stability

Three faults within about 1-1/4 miles of the dam have been mapped by others. The dam is located in Seismic Zone 1, as defined in Recommended Guidelines For Safety Inspection of Dams as prepared by the Corps of Engineers. In general, projects located in Seismic Zones 0, 1 and 2 may be assumed to present no hazard from earthquake, provided the static stability conditions are satisfactory and conventional safety margins exist.

SECTION 7: ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

a. Safety

The safety of Post Brook Dam is in question because there is inadequate capacity in the spillway to pass the PMF or one-half the PMF flood without overtopping the dam. Overtopping of the dam could cause extensive loss of life or excessive property damage downstream. Overtopping of the dam should cause only minor damage to the dam since the abutments and foundation are massive unweathered rock. The present spillways of Post Brook Dam and Irish Brook Dam combined can pass only about 6 percent of the PMF.

No definitive statement pertaining to the stability of the structure can be made without acquisition of the engineering properties of the soil providing passive resistance downstream, active thrust upstream, and the foundation. Nevertheless, the present dam has performed adequately since it was built in 1923, without failure or evidence of instability.

b. Adequacy of Information

The information and data uncovered is not adequate to perform a comprehensive, definitive evaluation of the dam's stability. Nevertheless, in view of the past performance of the dam, its present condition, and in light of stability calculations performed, it is not felt that additional information on the engineering properties of the local soil and foundation is necessary at this time.

c. Urgency

Studies to augment the spillway discharge capacity should be made within six months, and a plan formulation should be completed within a 12-month period.

A program for regularly observing seepage should be implemented within six months.

7.2 Remedial Measures

The alternatives available for increasing the spillway capacity are:

1. Increasing the dam height, of both Post Brook Dam and Irish Brook Dam, thus, permitting a higher discharge to pass over both dams without overtopping.

2. Increase the spillway capacity at Post Brook Dam, Irish Brook Dam, or both.

3. A combination of the above alternatives.

It must be emphasized that both dams must be modified at the same time for alternatives involving raising the dam.

7.3 Recommendations

Based on the visual inspection and data evaluation presented herein, the following action is recommended.

Brush and vines growing on the downstream face, and decayed vegetation at the toe should be removed and kept clean.

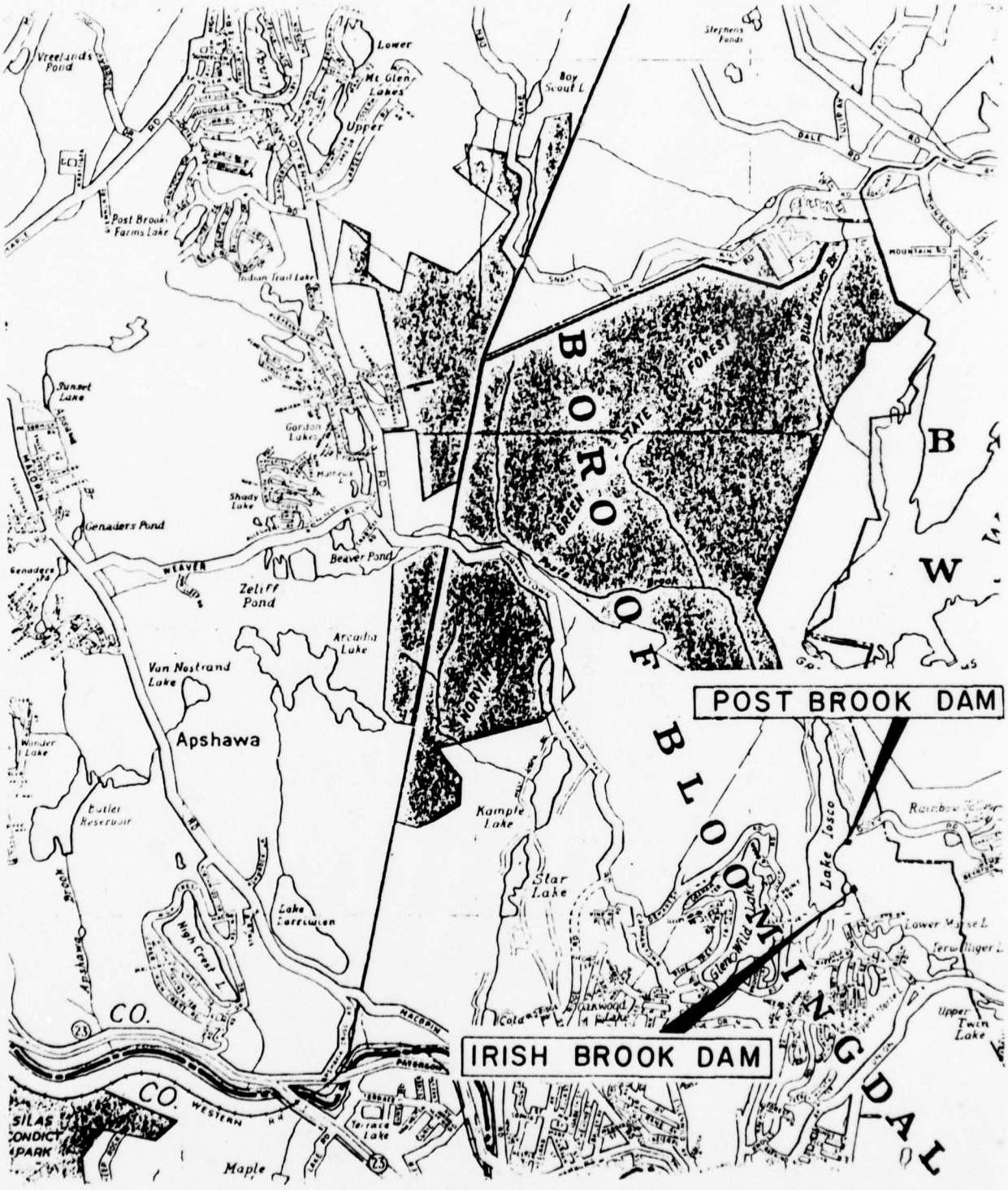
Areas of deteriorated, spalled or seriously cracked concrete should be repaired annually to prevent progressive damage.

Replace deteriorated stoplogs presently in the sluice.

The owner should initiate a program of annual inspections of the dam, utilizing the standard visual check list in this report.

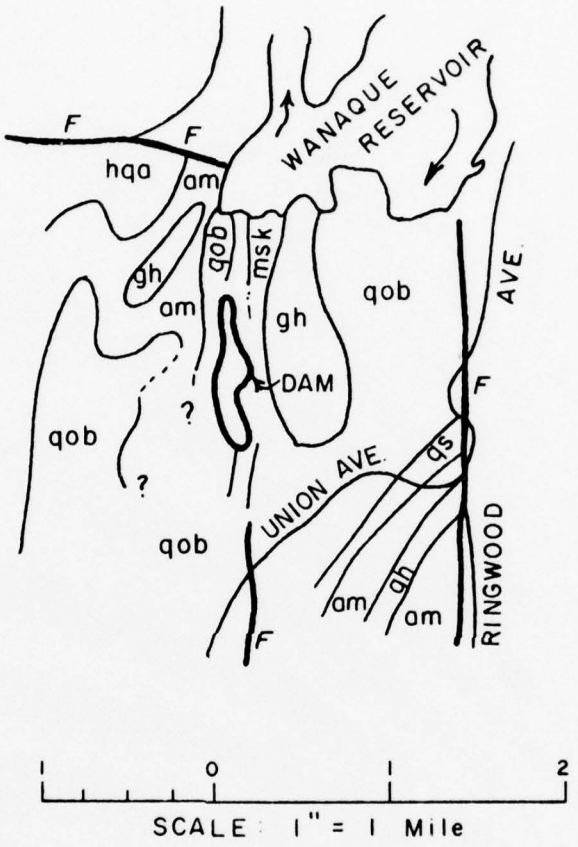
A permanent log should be kept of all maintenance and operating events of the dam and lake.

PLATES



VICINITY MAP

PLATE I

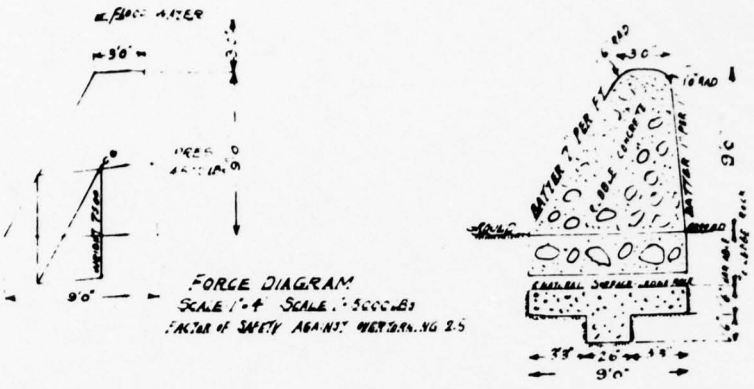


LEGEND

gh	MOSTLY HORNBLENDE GRANITE AND GNEISS
hqa	HYPERSTHENE - QUARTZ - ANDESINE GNEISS
am	AMPHIBOLITE
qob	QUARTZ - OLIGOCLASE - BIOTITE GNEISS
msk	MARBLE AND SKARN
qs	SILLIMANITE GNEISS

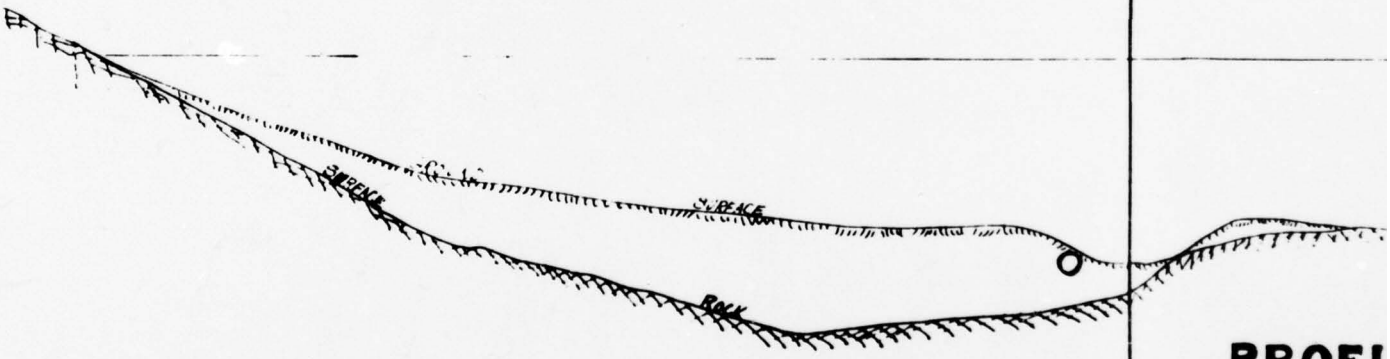
GEOLOGIC MAP
POST BROOK DAM

PLATE 2



PLAN

SCALE 1"=10'



PROFI

ELEVATION LOOK

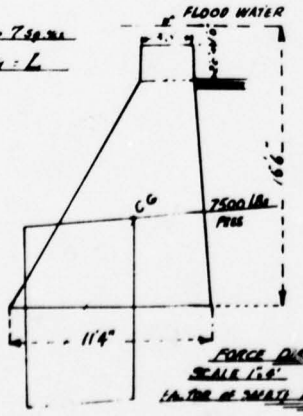
HOR. SCALE 1"=10' VE

DRAINAGE AREA = 7 sq mi

SPILLWAY LENGTH = L

L = 20√AREA in sq mi

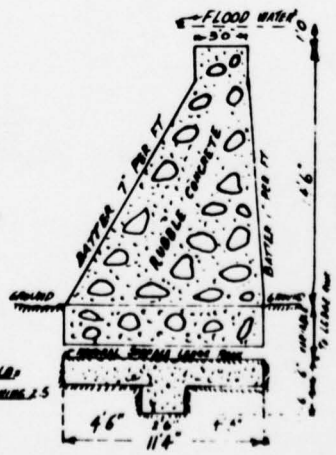
20 x 2.7 = 54



FORCE DIAGRAM

SCALE 1"=6' SCALE 1"=5000 LBS

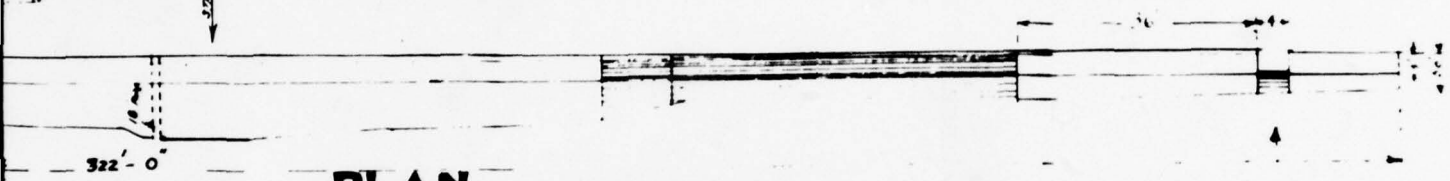
FACTOR OF SAFETY AGAINST OVERTURNING 2.5



SECTION ON AB

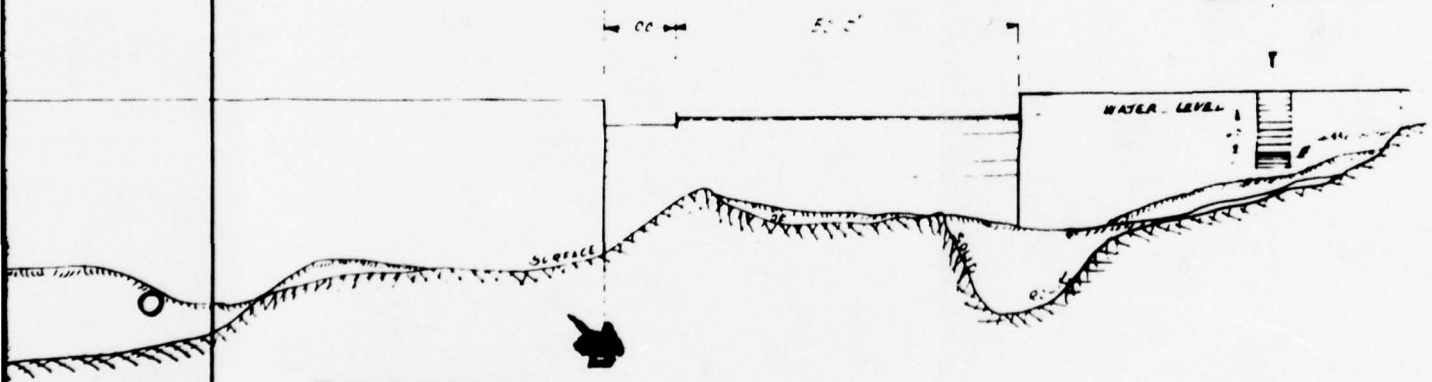
MAXIMUM HEIGHT

SECTION ON C.L. C.L.
AT SPILLWAY



PLAN
SCALE 1:10

PLAN AND LOCATION OF SLUICE GATE & LOWER WATER LEVEL



PROFILE
ELEVATION LOOKING UP STREAM
HOR. SCALE 1"=10' VER. SCALE 1"=5'

DAM
OVER THE POST BROOK
BLOOMINGDALE PASSAIC COUNTY, N.J.

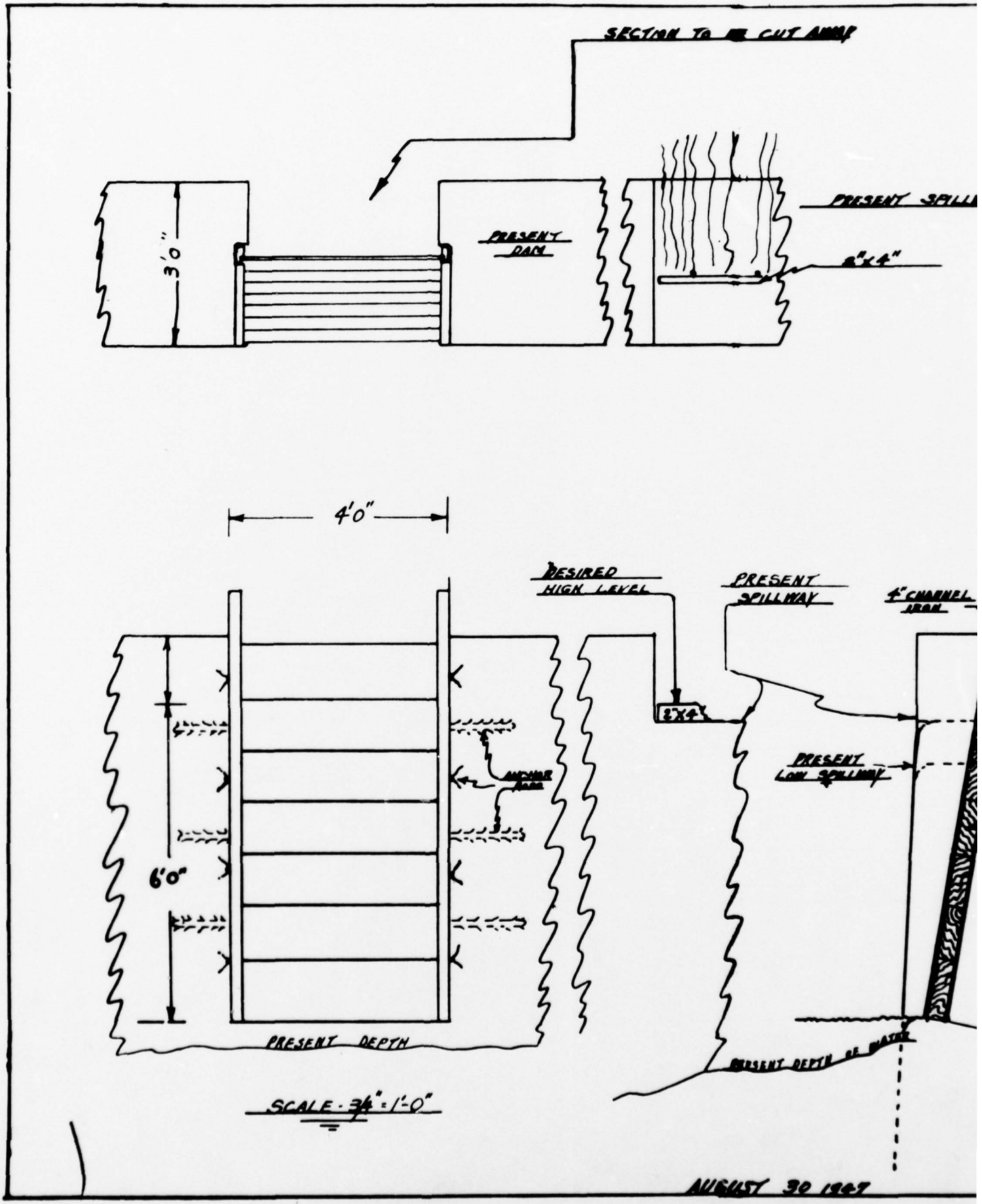
LAKE IOSCO CC

SECTION ON AB
MAXIMUM HEIGHT

FILE
DAM APPLICATION NO.

AUGUST 20, 194[illegible]

PLATE 3


SECTION TO BE CUT AWAY
PRESENT SPILL
PRESENT DAM
3'0"
6"x4"
4'0"
DESIRED HIGH LEVEL
PRESENT SPILLWAY
4" CHANNEL IRON
2X4
PRESENT LOW SPILLWAY
6'0"
PRESENT DEPTH
PRESENT DEPTH OF WATER
SCALE - 3/4" = 1'-0"
AUGUST 30 1967

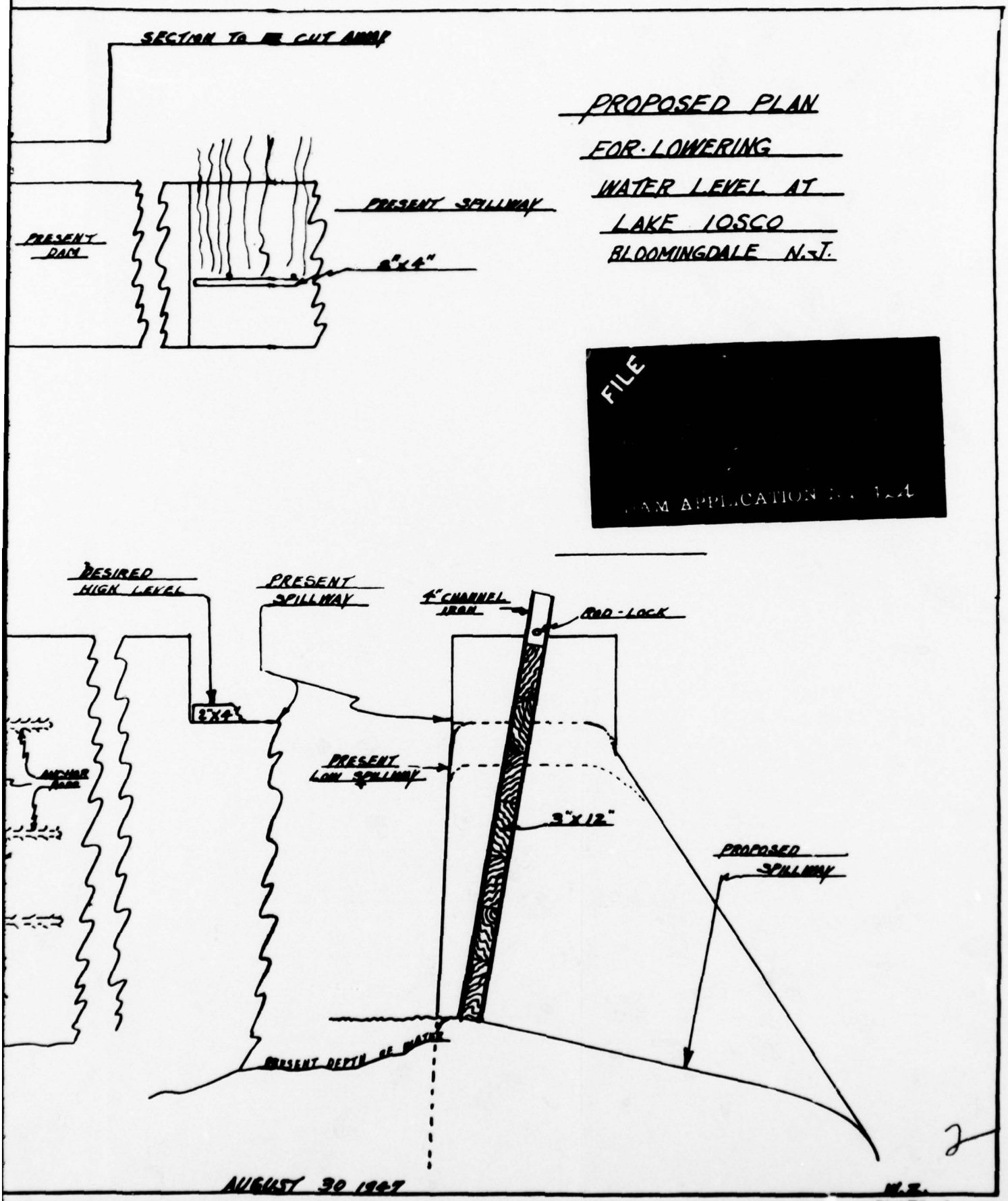
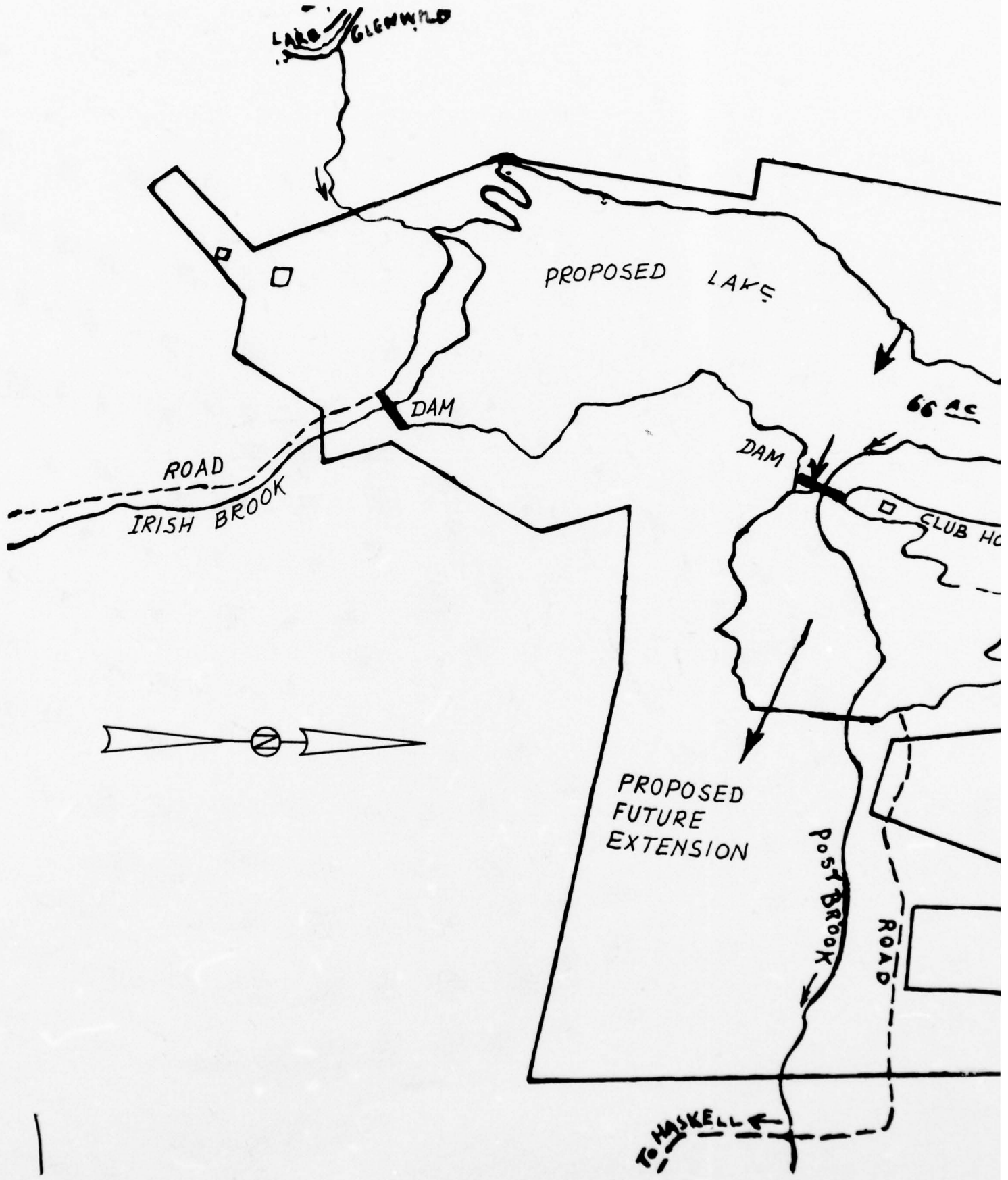
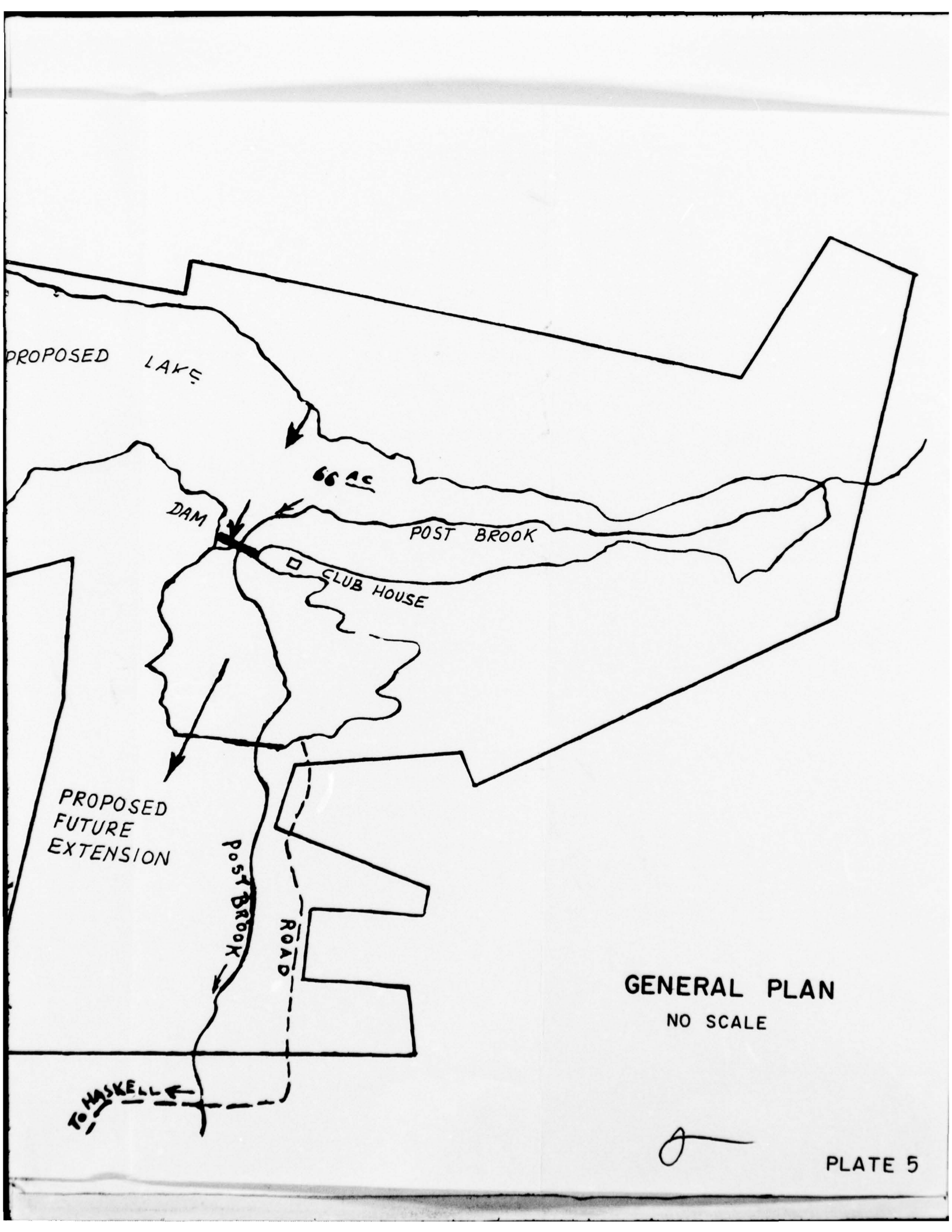

SECTION TO BE CUT AWAY
PROPOSED PLAN
FOR LOWERING
WATER LEVEL AT
LAKE IOSCO
BLOOMINGDALE N.J.
PRESENT SPILLWAY
PRESENT DAM
8"x4"
FILE
DESIRED HIGH LEVEL
PRESENT SPILLWAY
4" CHANNEL IRON
ROD-LOCK
2"X4"
PRESENT LOW SPILLWAY
9"X12"
PROPOSED SPILLWAY
PRESENT DEPTH OF WATER
AUGUST 30 1967
N.J.

PLATE 4


LAKE GLENWILD
PROPOSED LAKE
DAM
DAM
66 AC
ROAD
IRISH BROOK
CLUB HO
PROPOSED
FUTURE
EXTENSION
POST BROOK
ROAD
TO HASKELL



GENERAL PLAN

NO SCALE

PLATE 5

APPENDIX A

CHECK LIST - VISUAL OBSERVATIONS

CHECK LIST - ENGINEERING, CONSTRUCTION MAINTENANCE DATA

CHECK LIST

Visual Inspection
Phase I

Name Dam Post Brook County Passaic State New Jersey Coordinators _____

Date(s) Inspection June 28, 1978 Weather Clear-Warm Temperature 75°F

Pool Elevation at Time of Inspection _____ M.S.L. Tailwater at Time of Inspection _____ M.S.L.

Inspection Personnel:

(June 28, 1978)

Joe Sirianni

Henry King

David Kerkes

(July 6, 1978)

Yin Au-Yeung

Lynn Brown

Robert B. Campbell Recorder

Owner Representative:

(June 28, 1978)

Niel Dunning, President
Mr. Starms, Member
John Dunning, Member

Lake Iosco Corporation
c/o Richard Zuidema, Secretary (Not Present)
Morse Lake Road
Bloomingdale, New Jersey 07403

CONCRETE/MASONRY DAMS

Type - Straight Concrete Gravity Dam

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SEEPAGE OR LEAKAGE	Most horizontal construction joints show evidence of past seepage by way of minor leach deposits. Nearly all joints were dry at time of inspection. A seep or spring flow about 2 gpm was found about 75 feet downstream of dam about midway between right abutment and spillway.	Clean and waterproof upstream face of dam to minimize seepage. Observe and record monthly condition of flow from seep or spring to detect changes in quantity or clarity of water.
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Concrete placed directly on bedrock. Junctions generally good. Minor seepage between concrete and rock near top of dam at right abutment. Rock outcrops at left and right abutments.	
DRAINS	None - N.A.	
WATER PASSAGES	2'-0" wide by 6'-2" deep outlet slot in concrete dam. Wood stoplogs in outlet slot, leakage estimated to be about 20 gpm. Slot has been rehabilitated and new angle iron stoplog guides installed. Only superficial rusting of angle irons. Bottom stop boards showing evidence of minor rotting.	Rotted stop boards should be replaced. Stop boards should be of wood impregnated with preservative.
FOUNDATION	Dam founded on bedrock.	

CONCRETE/MASONRY DAMS

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Moderate spalling on downstream face. Much spalling of mortar cap on crest to a depth of 1"±. Severe spalling at left end of dam just above contact at about reservoir water surface. Upstream face has had 1/2" mortar layer applied apparently many years ago. No spalling of mortar evident on upstream face.	Clean and repair badly spalled areas. Inspect dam annually to detect new seepages and/or spalled areas. Apply face slabs or other waterproofing to upstream face whenever seepages are found.
STRUCTURAL CRACKING	Several through joints are visible. Concrete appears strong and sound.	
VERTICAL AND HORIZONTAL ALIGNMENT	No evidence of movement of dam can be found.	
MONOLITH JOINTS	Vertical joint or possible through crack in spillway section, but did not appear to be leaking.	
CONSTRUCTION JOINTS		Downstream face should be cleaned of vines and vegetation. Dam should be inspected once a month during growing season to keep vegetation from growing roots into joints and cracks.

EMBANKMENT

Post Brook

Type - None

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	N.A.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	N.A.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	N.A.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	N.A.	
RIPRAP FAILURES	N.A.	

EMBANKMENT

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	N.A.	
ANY NOTICEABLE SEEPAGE	N.A.	
STAFF AND GAGE RECORDER	N.A.	
DRAINS	N.A.	

OUTLET WORKS

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	See Water Passages under Concrete/Masonry Dams section.	
INTAKE STRUCTURE	N.A.	
OUTLET STRUCTURE	N.A.	
OUTLET CHANNEL	Heavily wooded natural channel.	
EMERGENCY GATE	None.	

UNGATED SPILLWAY

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Two level weir with rounded crest and stop board slot in top. Each level has 2" x 8" board in slot. Surface has been moderately spalled downstream face and lightly spalled upstream face. Vertical construction joint in middle of spillway appears tight.	Surface should be cleaned and patched when spalled depth exceeds 3-4 inches.
APPROACH CHANNEL	None.	
DISCHARGE CHANNEL	None - Spillway discharges directly onto bedrock. Channel meanders downstream. Heavily wooded.	Dead wood and debris should be removed from area.
BRIDGE AND PIERS	None.	

GATED SPILLWAY

(None)

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	N.A.	
APPROACH CHANNEL	N.A.	
DISCHARGE CHANNEL	N.A.	
BRIDGE AND PIERS	N.A.	
GATES AND OPERATION EQUIPMENT	N.A.	

INSTRUMENTATION

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER	None	

RESERVOIR

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Gently sloping away from lake. Slopes are heavily wooded and appear stable.	
SEDIMENTATION	Sedimentation appears to be occuring very slowly. Depth to bottom on upstream side of dam is about 8 feet.	
SHORELINE STRUCTURES	No dwellings on or near shorelines. Only structures on shoreline are boat docks and watersport associated facilities.	
USE	Recreation only -- Mostly boating and fishing. No power boats allowed on lake.	
OPERATION	Reservoir is drawn down to bottom of outlet slot every 5 to 7 years for inspection and repair of upstream face of dam. Next inspection tentatively scheduled for 1980. Reservoir is lowered 1-1/2 to 2 feet each winter and raised again in early spring.	

DOWNSTREAM CHANNEL

Post Brook

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Heavily overgrown with trees and brush. Much debris. Multiple concrete pipe culverts (three 18" diameter and one 36" diameter) under private road. Left side of road profile (looking downstream) is lower than right side by 3 to 4 feet. Channel downstream road continues heavily wooded.	
SLOPES	Heavily wooded and rocky with gentle sideslopes. Broad valley bottom.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	Few dwellings downstream, all 20′ or more above stream level.	

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION

Post Brook Dam on Lake Iosco

ITEM	REMARKS
PLAN OF DAM	Available.
REGIONAL VICINITY MAP	Available.
CONSTRUCTION HISTORY	None available. Records on file with the New Jersey Environmental Protection Agency indicate that the dam was built about 1923. Minor modifications in 1947.
TYPICAL SECTIONS OF DAM	Available.
HYDROLOGIC/HYDRAULIC DATA	None available.
OUTLETS - PLAN	)
- DETAILS	) None Available.
- CONSTRAINTS	)
- DISCHARGE RATINGS	)
RAINFALL/RESERVOIR RECORDS	None Available.

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION
(Continued)

Post Brook Dam on Lake Iosco

ITEM	REMARKS
DESIGN REPORTS	None available.
GEOLOGY REPORTS	None available.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None available.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None available.
POST-CONSTRUCTION SURVEYS OF DAM	None available.
BORROW SOURCES	Unknown.
SPILLWAY - PLAN - SECTIONS - DETAILS	Available.

CHECK LIST
ENGINEERING DATA

DESIGN, CONSTRUCTION, OPERATION
(Continued)

Post Brook Dam on Lake Iosco

ITEM	REMARKS
OPERATING EQUIPMENT PLANS AND DETAILS	None available.
MONITORING SYSTEMS	None available.
MODIFICATIONS	None.
HIGH POOL RECORDS	None available.
POST-CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available.
PRIOR ACCIDENTS OR FAILURE OF DAM - DESCRIPTION - REPORTS	No reports of accidents or failure were found during the investigation.
MAINTENANCE, OPERATION RECORDS	None available.

APPENDIX B

PHOTOGRAPHS

All photos were taken on June 28, 1978.

Photo 1 - View of dam, outlet notch and spillway from left abutment.

Photo 2 - View of dam from upstream right shoreline.

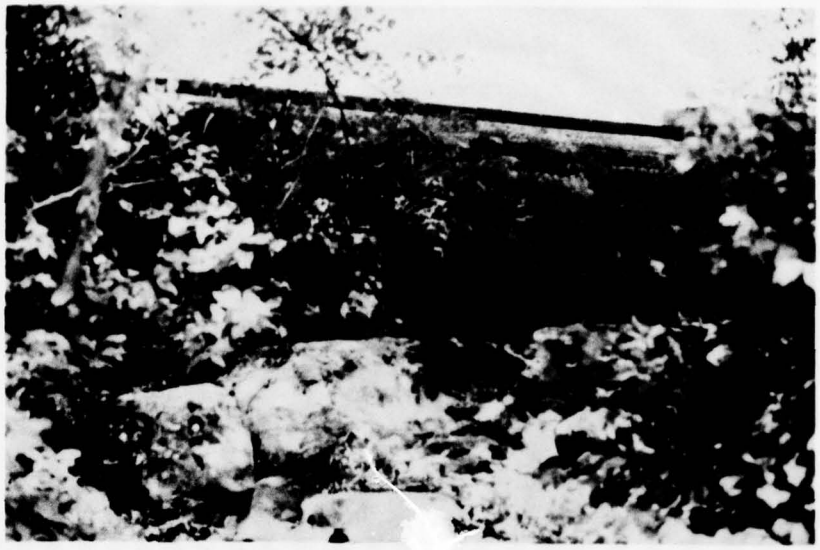


Photo 3 - Right side of spillway from downstream.

Photo 4 - Spillway crest.

Photo 5 - Downstream face of spillway.

Photo 6 - Concrete deterioration and spalling in downstream face of spillway at joint.

Photo 7 - Typical spalling on downstream face of dam.

Photo 8 - Concrete deterioration and leakage over rock outcrop at left abutment.

Photo 9 - View of downstream showing low level outlet notch and stoplogs.

Photo 10 - Discharge channel looking downstream from left of spillway.

Photo 11 - Multiple culverts under private road downstream of dam.

Photo 12 - View looking upstream at dam from culverts.

Photo 13 - View looking downstream from culverts.

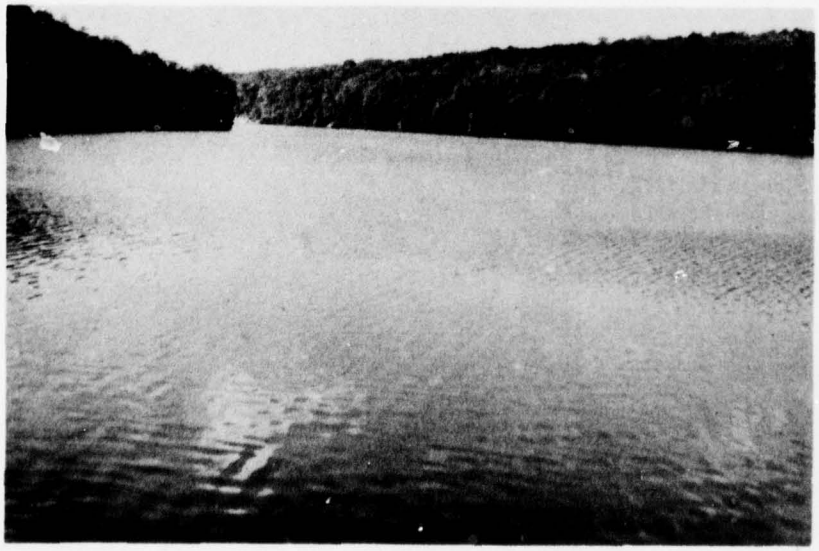


Photo 14 - View of Lake Iosco and shorelines.

APPENDIX C

SUMMARY OF ENGINEERING DATA

CHECK LIST

HYDROLOGIC AND HYDRAULIC DATA

ENGINEERING DATA

Name of Dam: Post Brook Dam

Drainage Area: 3.7 square miles

Elevation Top Normal Pool (Storage Capacity): 267.9 (990 AF)

Elevation Top Flood Control Pool (Storage Capacity): N.A.

Elevation Maximum Design Pool: 268.8

Elevation Top of Dam: 270

SPILLWAY CREST:

a. Elevation: 268.1 (Spillway Notch)

b. Type: Overflow

c. Width: 10 feet (Spillway Notch); 59.6 feet (Total Spillway)

d. Length: N.A.

e. Location Spillover: Mid-section of the dam

f. Number and Type of Gates: None

OUTLET WORKS:

a. Type: Sluice at dam crest

b. Location: 40 feet from left abutment

c. Entrance Inverts: 264

d. Exit Inverts: 264

e. Emergency Draindown Facilities: Only this sluice

HYDROMETEOROLOGICAL GAGES: (N.A.)

a. Type:

b. Location:

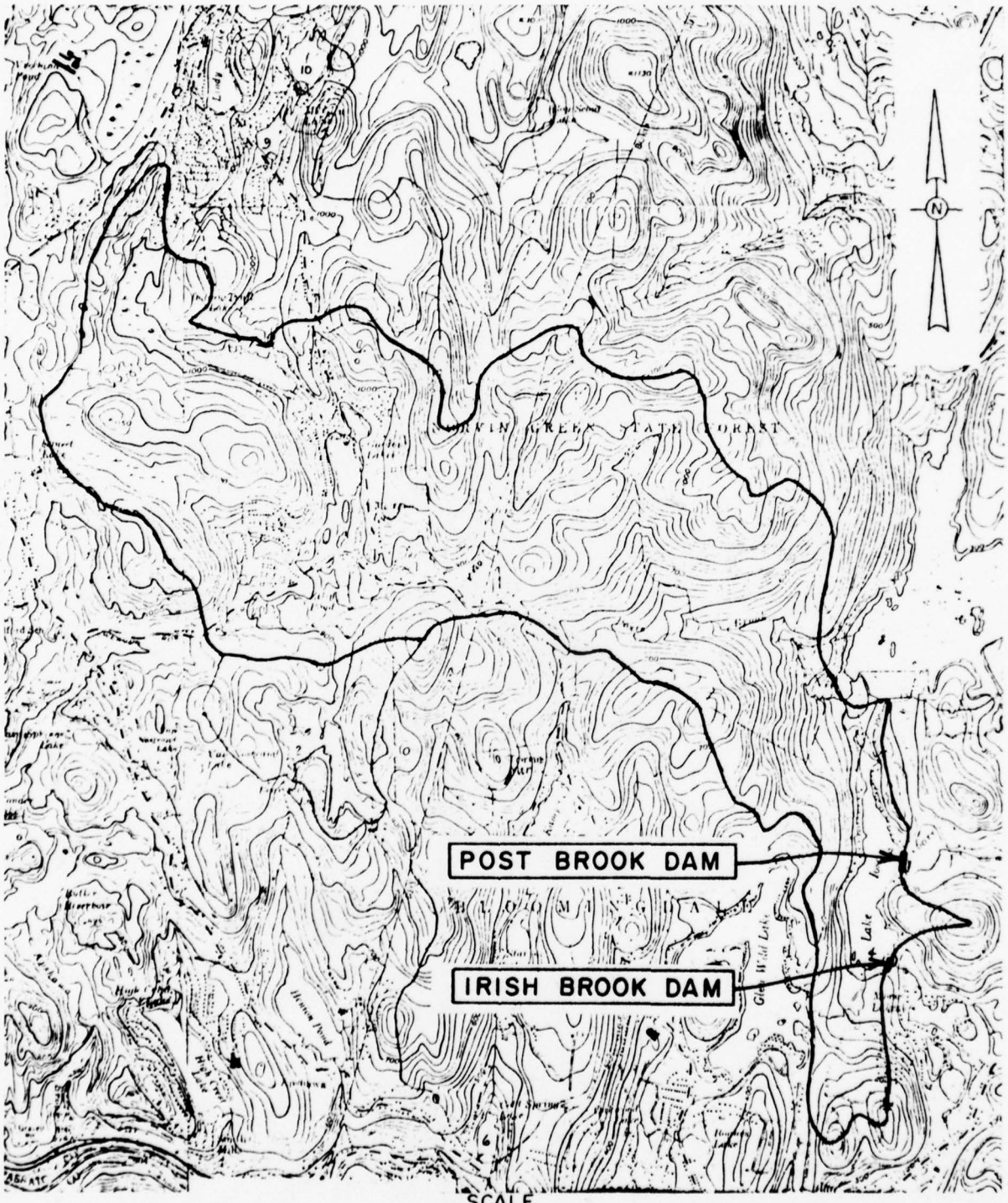
c. Records:

MAXIMUM NON-DAMAGING DISCHARGE: 158 cfs (Estimated)

APPENDIX D

HYDROLOGIC COMPUTATIONS

PLATE I APPENDIX D



IRISH BROOK AND POST BROOK DAMS
DRAINAGE MAP

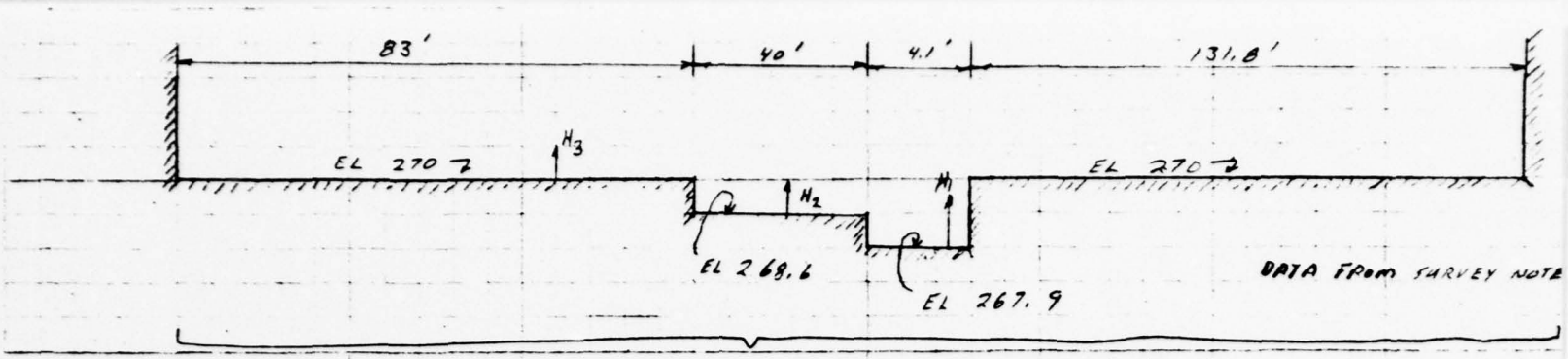
ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 1 OF

IRISH BROOK DAM JOB NO. 12-12-001-1

SPILLWAY AND OVERTOP RATING CURVE BY KLB DATE 8-5-78

ECI-4



TREAT AS BROAD CRESTED WEIR

$L_1 = 4.1'$, $L_2 = 40'$, $L_3 = 83 + 131.8 = 214.8'$

ELEV (FT)	HEAD ON MAIN SPILLWAY CREST	H_1	H_2	H_3	L_1	L_2	L_3	C_1	C_2	C_3	$Q = \sum_{i=1}^{3} C_i L_i H_i^{1.5}$
267.9	0.0	0.0			4.1						0
268.6	0.7	0.7			4.1			3.03			7.3
269.0	1.1	1.1	0.4		4.1	40.0		3.03	3.03		45.0
270.0	2.1	2.1	1.4		4.1	40.0		3.03	3.03		238.6
271.0	3.1	3.1	2.4	1.0	4.1	40.0	214.8	3.03	3.03	3.03	1169.3
272.0	4.1	4.1	3.4	2.0	4.1	40.0	214.8	3.03	3.03	3.03	2703.8
273.0	5.1	5.1	4.4	3.0	4.1	40.0	214.8	3.03	3.03	3.03	4643.6
275.0	7.1	7.1	6.4	5.0	4.1	40.0	214.8	3.03	3.03	3.03	9474.0
277.0	9.1	9.1	8.4	7.0	4.1	40.0	214.8	3.03	3.03	3.03	15345.5

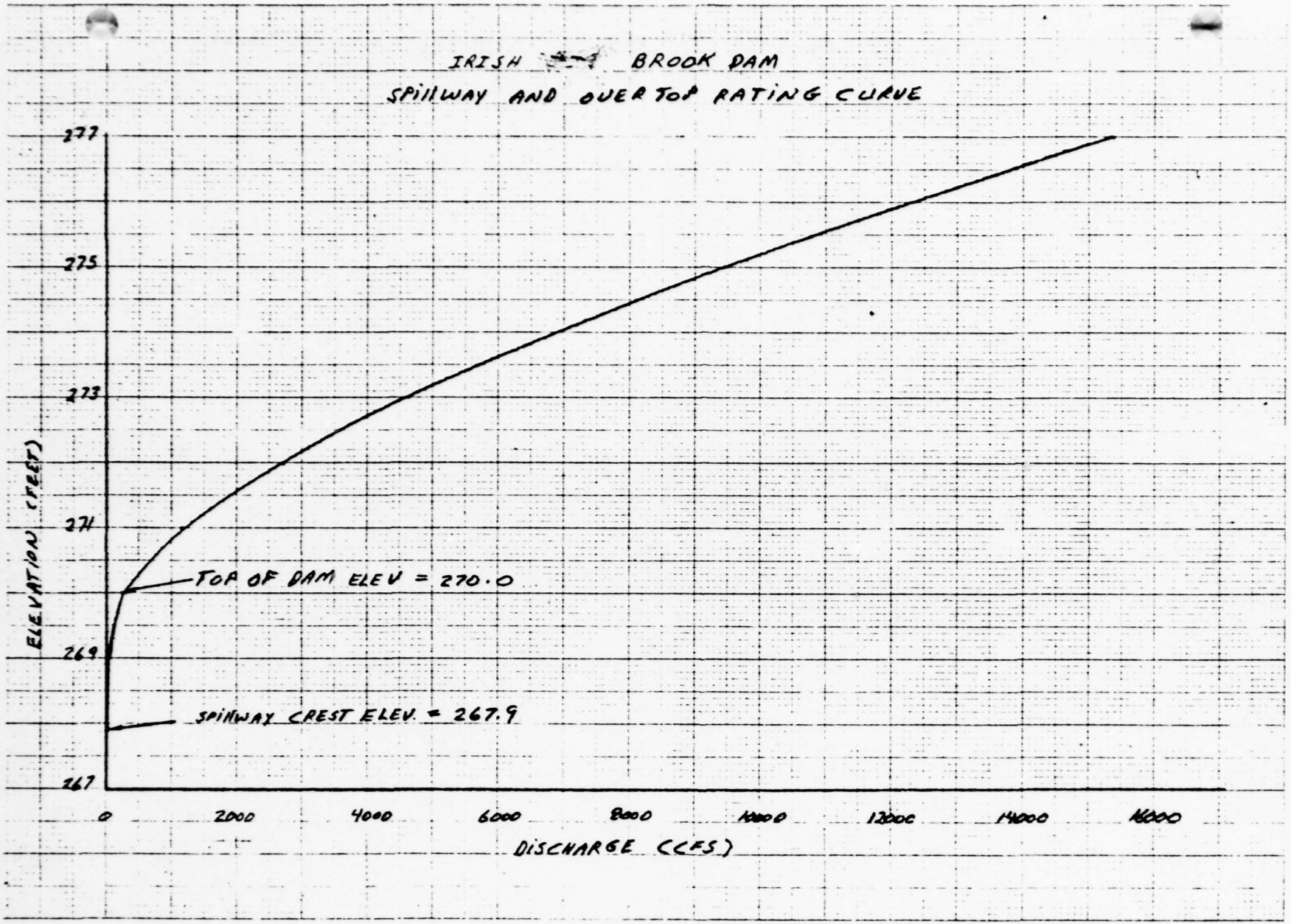
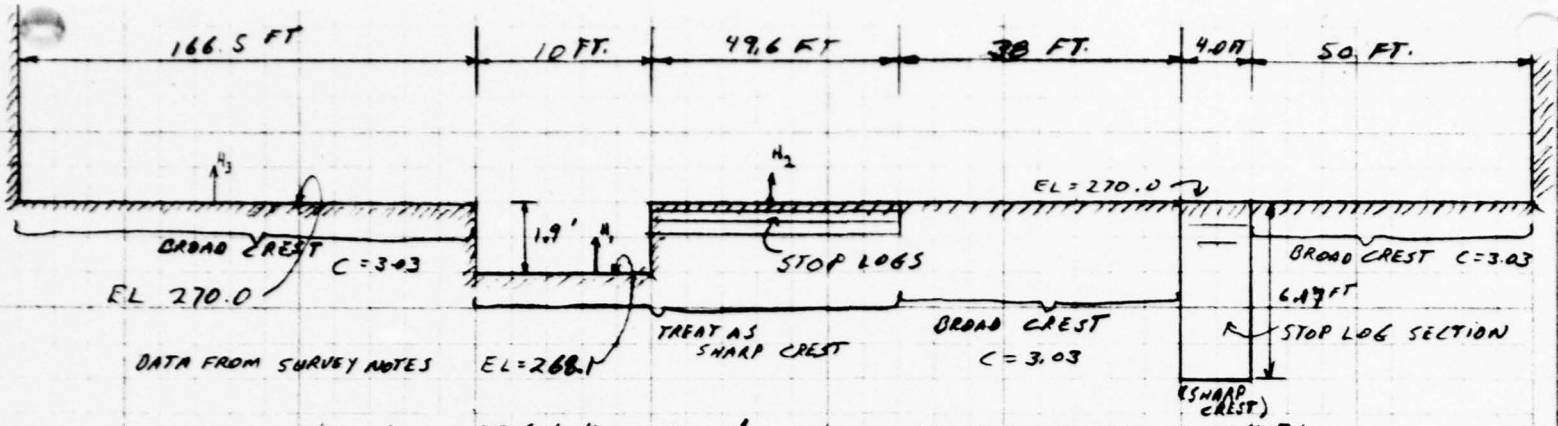


PLATE 2, APPENDIX D

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 1 OF

POST BROOK DAM JOB NO. 1212-001-1

SPILLWAY AND OVERTOP RATING CURVE (REVISED) BY KLB DATE 8-Y-78

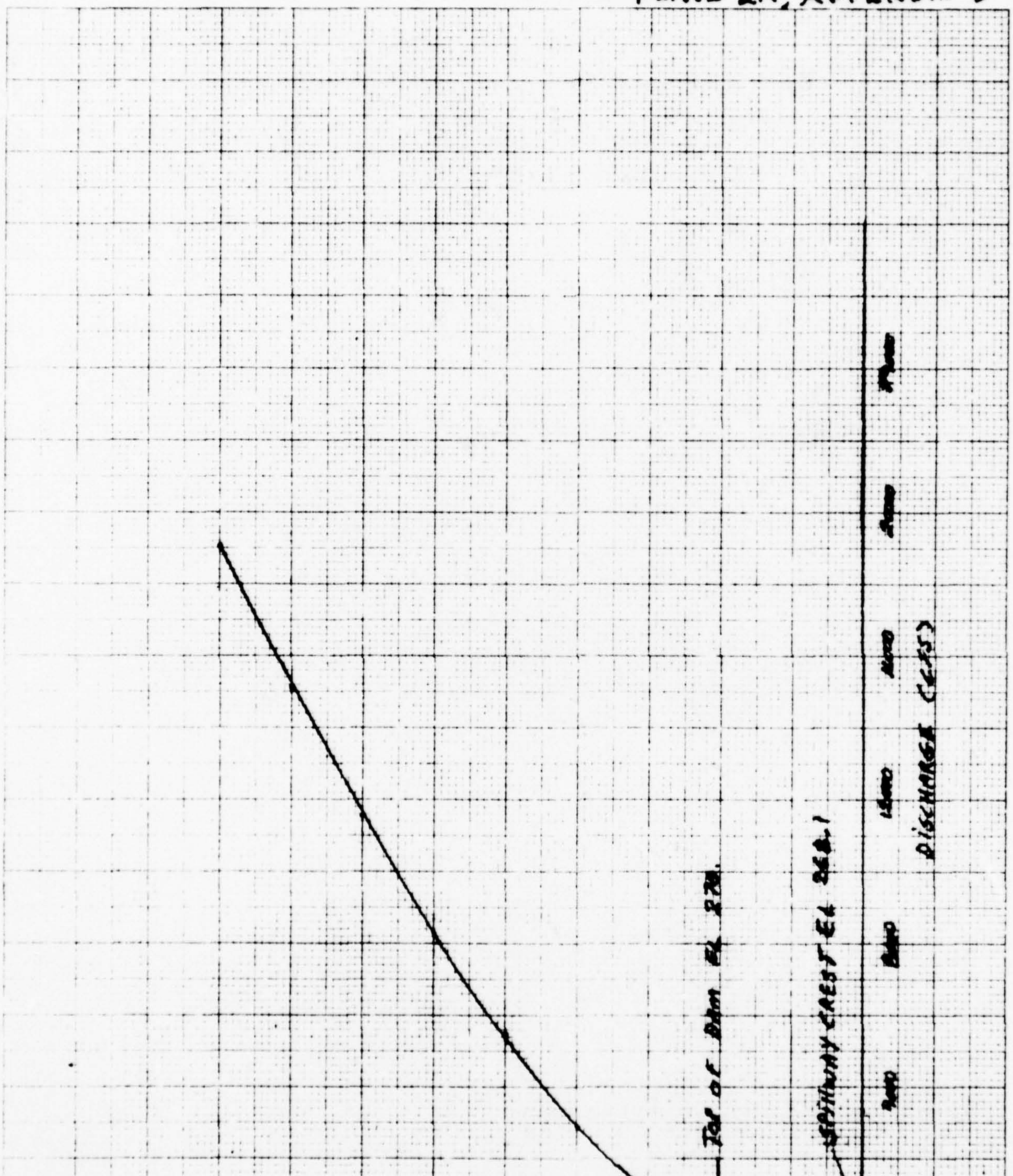


$L_1 = 10'$ $L_2 = 49.6 + 4 = 53.6'$, $L_3 = 166.5 + 38 + 50 = 254.5'$

C_1 = VARIES, C_2 = VARIES $C_3 = 3.03$

ELEV.	HEAD ON MAIN SPILLWAY CREST	H_1 (FT)	H_2 (FT)	H_3 (FT)	L_1 (FT)	L_2 (FT)	L_3 (FT)	C_1	C_2	C_3	$Q = \sum_{i=1}^{3} C_i L_i H_i^{1.5}$ (CFS)
268.1	0	0	0	0							0
269.0	0.9	0.9	0	0	10			3.2			27.3
270.0	1.9	1.9	0	0	10			3.4			89.0
271.0	2.9	2.9	1.0	1.0	10	53.6	254.5	3.6	3.2	3.03	1121.0
272.0	3.9	3.9	2.0	2.0	10	53.6	254.5	3.8	3.4	3.03	2989
273.0	4.9	4.9	3.0	3.0	10	53.6	254.5	3.8	3.6	3.03	5422
274.0	5.9	5.9	4.0	4.0	10	53.6	254.5	3.8	3.8	3.03	8843
275.0	6.9	6.9	5.0	5.0	10	53.6	254.5	3.8	3.8	3.03	11588
276.0	7.9	7.9	6.0	6.0	10	53.6	254.5	3.8	3.8	3.03	15170
277.0	8.9	8.9	7.0	7.0	10	53.6	254.5	3.8	3.8	3.03	19063

PLATE 2A, APPENDIX D



PAST BROOK DAM
SPILLWAY AND OVERTOP RATING

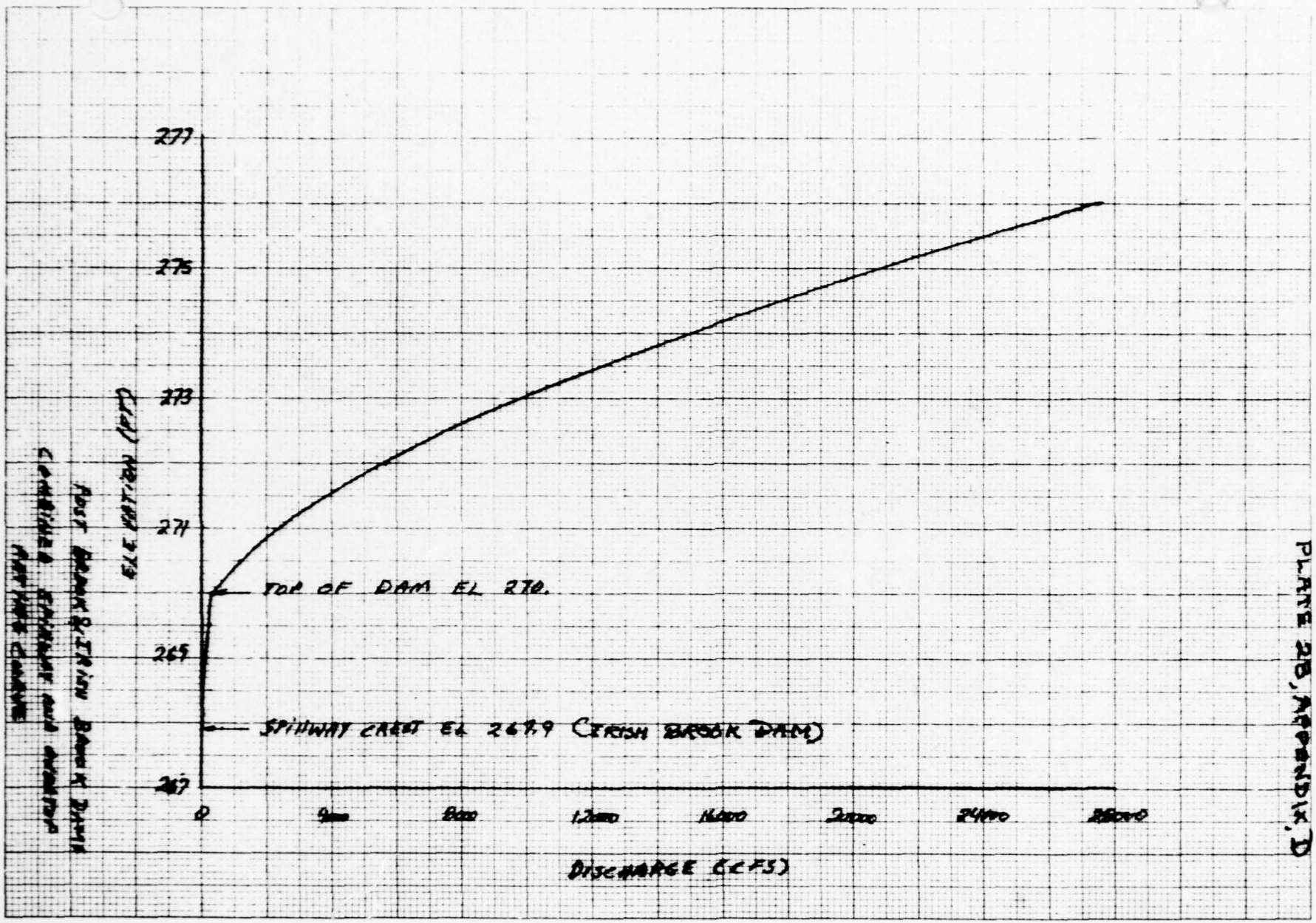
ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 1 OF
POST BROOK AND IRISH BROOK DAMS — JOB NO. 1212-001-1
COMBINED OVERTOP + SPILLWAY DISCHARGES — BY EBJ DATE 8-11-78

POST BROOK AND IRISH BROOK DAMS

COMBINED SPILLWAY & OVERTOP DISCHARGES

ELEV. (FT)	POST BROOK DAM (DISCHARGE) (CFS)	IRISH BROOK DAM (DISCHARGE) (CFS)	TOTAL DISCHARGE (CFS)
267.9 (SPILLWAY CREST) IRISH BK. DAM	-	0	0
268.1 (SPILLWAY CREST) POST BK. DAM	0	3.5	3.5
269.0	27.3	45.0	72.3
269.5	80.0	120.0	200.0
269.9	88.0	230.0	318
270.0 (TOP OF DAMS)	89.0	238.6	327.6
270.1	200.0	360.0	560.0
270.5	500.0	700.0	1200.0
272.0	2989.0	2703.8	5692.8
276.0	15170.0	12300.0	27470.0


277
275
273
271
269
267
ELEVATION (MSL)
TOP OF DAM EL 270.
SPILLWAY CREST EL 269.9 (TRISH BROOK DAM)
0
4000
8000
12000
16000
20000
24000
28000
DISCHARGE (CFS)
POST BROOK & TRISH BROOK DAMS
COMBINED DISCHARGE AND ELEVATION
PLATE 2B, APPENDIX D

C1-4 ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION — SHEET NO. 1 OF
POST BROOK AND IRISH BROOK DAMS — JOB NO. 1212-001-1
RESERVOIR AREA CAPACITY DATA — BY KLB DATE 8-9-78

LAKE IOSCO

RESERVOIR AREA CAPACITY DATA

MAXIMUM STORAGE = 1056 AC-FT

NORMAL STORAGE = 990 AC-FT

RESERVOIR SURFACE AREA = 73 ACRES

AT AN ELEVATION OF 267.9 ±

ELEV (FT)	HEAD ON SPILLWAY CREST (Irish BK. dam)	RESERVOIR AREA (ACRES)	RESERVOIR VOLUME (AC-FT)	REMARKS
267.9±	0.	73	990	NORMAL VOLUME OF 990 AC-FT IS ASSUMED TO BE AT SPILLWAY CREST OF Irish Brook Dam
268.1	0.2	73.2	1005	Volume at Spillway Crest of Post BK. Dam
268.8	0.9	74	1056	Elev. at maximum Storage
270.0	2.1	75	1137	STORAGE AT TOP OF DAM
280.0	12.1	85	1937	
300.0	32.1	138	4167	

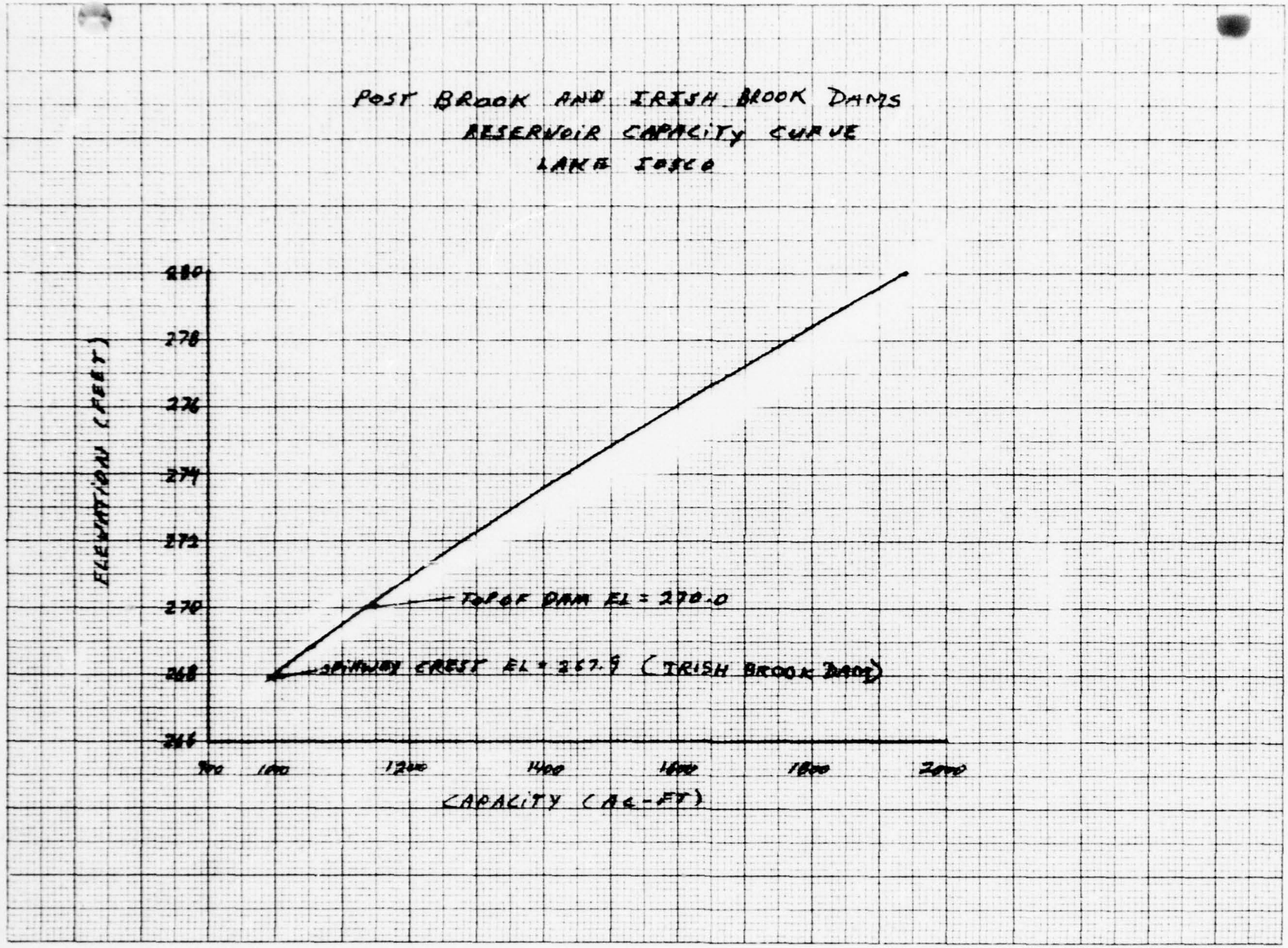


PLATE 3, APPENDIX D

ECI-4 **ENGINEERING CONSULTANTS, INC.**

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 1 OF ____
POST BROOK AND IRISH BROOK DAMS JOB NO. 1210-001-1
UNIT HYDROGRAPH BY KLB DATE 7-26-

UNIT HYDROGRAPH - POST BROOK, IRISH BROOK

a) DRAINAGE AREA = 3.7 SQ. MI.

b) L = 3.79 MILES (FROM PAGE 2)

c) T_c = 0.87 HR (FROM PAGE 2)

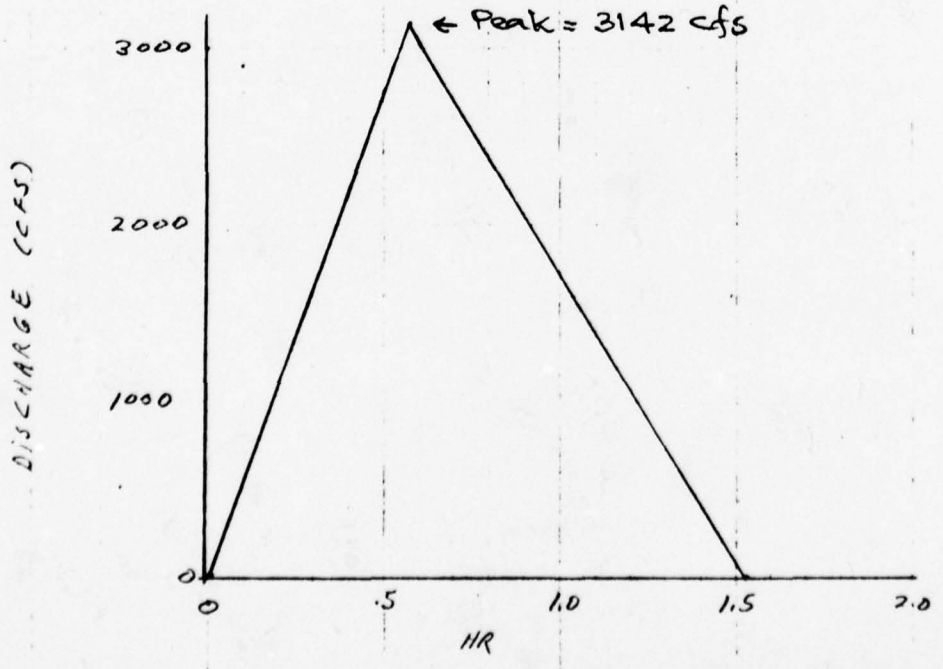
d) ASSUME $D = 0.10 < \frac{T_c}{2}$

e) $T_p = \frac{D}{2} + 0.6\,T_c = 0.05 + 0.6 \times 0.87$

$= 0.57$ HR

f) $T_b = 2.67\,T_p = 2.67 \times 0.57 = 1.53$ HR

g) q_p cfs $= \frac{484\,A\text{(sq. mi.)}}{T_p\text{ (HR)}} = \frac{484 \times 3.7}{0.57} = 3142$ CFS



ECI-4 ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 2 OF ____
POST BROOK DAM, IRISH BROOK DAM JOB NO. P12-001-1
DETERMINE BASIN PARAMETERS. BY KLB DATE 7-26-

FROM U.S.G.S. QUAD SHEETS

DRAINAGE AREA = 3.7 SQ mi.

DETERMINE LENGTH OF STREAM

$L = 10.00'' \times \frac{24000}{12 \times 5280} = 3.79$ MILES = 20000 FT.

DETERMINE BASIN SLOPE

$\Delta H = 1170 - 270 = 720$ FT.

DETERMINE TIME OF CONCENTRATION

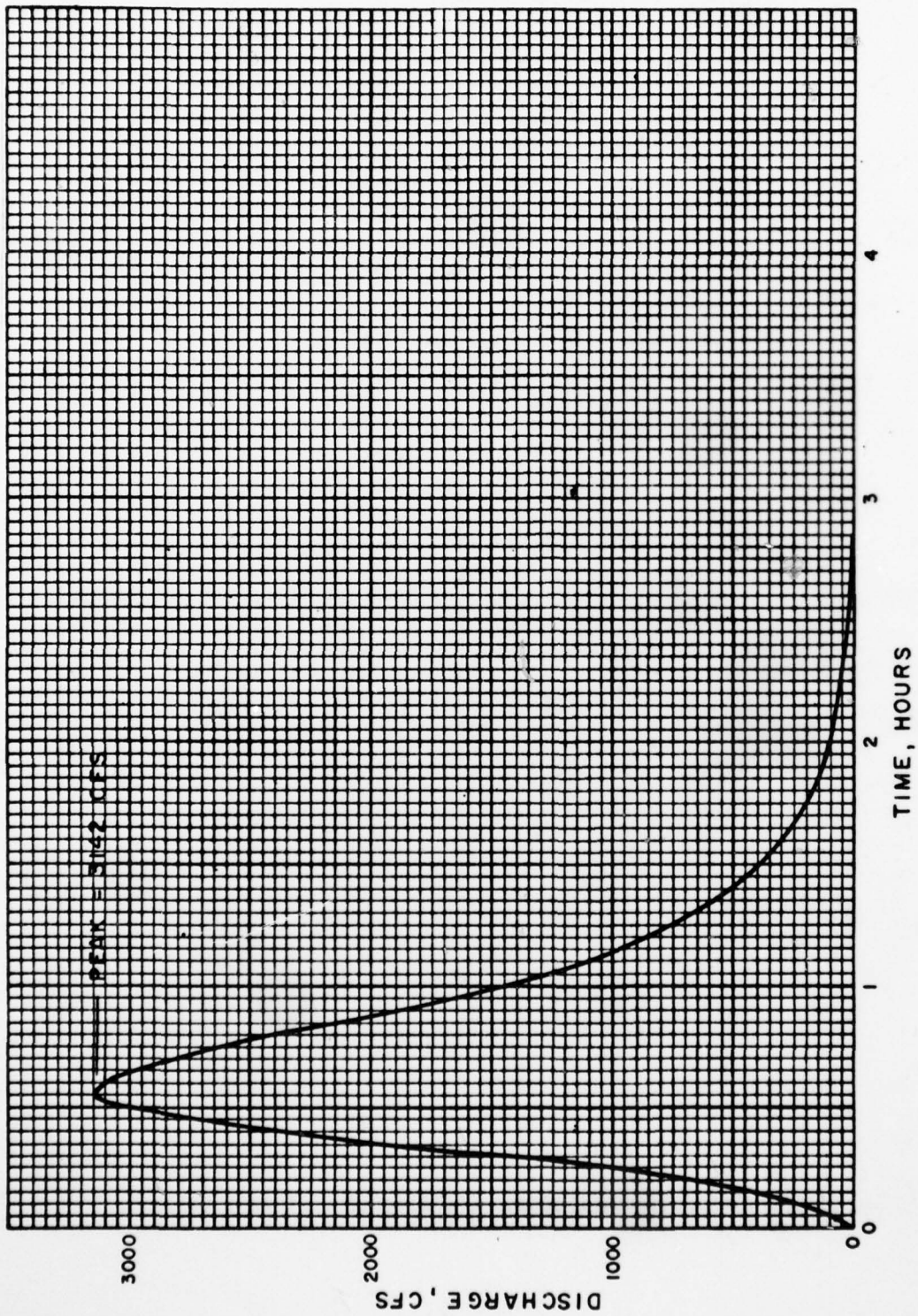
$$T_c = \left(\frac{11.9 L^3}{\Delta H}\right)^{0.385} = \left(\frac{11.9 \times 3.79^3}{720}\right)^{0.385}$$

$$= 0.87 \text{ HR.}$$

ECI-4 ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 3 OF ____
POST BROOK & IRISH BROOK DAMS JOB NO. 1212-001-1
UNIT HYDROGRAPH BY KLB DATE 2-76

TIME RATIO T/Tp	DISCHARGE RATIO Q/Qp	UNIT GRAPH	
		TIME (HR)	DISCHARGE (CFS)
0	0	0	0.
0.1	0.015	0.06	47.1
0.2	0.075	0.11	235.7
0.3	0.16	0.17	502.7
0.4	0.28	0.23	879.8
0.5	0.43	0.29	1351.1
0.6	0.60	0.34	1885.2
0.7	0.77	0.40	2419.3
0.8	0.89	0.46	2796.4
0.9	0.97	0.51	3047.7
1.0	1.00	0.57	3142.0
1.1	0.98	0.63	3079.2
1.2	0.92	0.68	2890.6
1.3	0.84	0.74	2639.3
1.4	0.75	0.80	2356.5
1.5	0.66	0.86	2073.7
1.6	0.56	0.91	1759.5
1.8	0.42	1.03	1319.6
2.0	0.32	1.14	1005.4
2.2	0.24	1.25	754.1
2.4	0.18	1.37	565.6
2.6	0.13	1.48	408.5
2.8	0.098	1.60	307.9
3.0	0.075	1.71	235.7
3.5	0.036	2.00	113.1
4.0	0.018	2.28	56.6
4.5	0.009	2.57	28.3
5.0	0.004	2.85	12.6



IRISH BROOK AND POST BROOK DAMS
0.10 HOUR UNIT HYDROGRAPH

Probable Maximum Precipitation JOB NO. [illegible] BY JJJ DATE July 197[illegible]

PROBABLE MAXIMUM FLOOD CALCULATION (PMF)

DRAINAGE = 3.7 sq. mi

From Hydrometeorological Report "33" Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Duration of 6, 12, 24 and 48 Hours" 1956

for D.A. = 10 sq. mi.

6 Hour rainfall duration.

PMP = 25" for Zone "6" at this Basin.

Since D.A. < 10 sq. mi. No area reduction to be applied

PMP Values for varies rain fall duration

Duration	PMP (inch)	
6 Hr.	1.0 ×	25.0"
12 Hr.	1.09 ×	27.25"
24 Hr.	1.17 ×	29.25"
48 Hr.	1.26 ×	31.50"

PMP values are reduced by 20% to account for misalignment of Basin and Storm's Isohyetal.

Duration	PMP
6 Hr	
12 Hr	
24 Hr	: Can be neglected.
48 Hr	

PMP-PMF DERIVATION

1. SOIL GROUP 'C' & AMC II
2. CN = 85

Minimum loss rate for above condition
= 0.12"/hr or 0.012"/0.1hr.

For CN = 85

S = 1.76 in the Eq.

$$Q = \frac{(P-0.2S)^2}{P+0.8S}$$

$$\text{or } Q = \frac{(P-0.352)^2}{P+1.408}$$

ECI-4 ENGINEERING CONSULTANTS, INC.

NEW JERSEY DAM SAFETY INSPECTION - (DEP) SHEET NO. 1 OF 2

PMF DERIVATION - POST BROOK AND IRISH BROOK JOB NO. 1212-001-1

DIRECT RUNOFF BY KLB DATE 7-28-7

DIRECT RUNOFF INCREMENTS FOR COMPUTING - PMF

	TIME ENDING (HR)	INCREMENTAL DESIGN RAINFALL (IN)	ACCUMULATIVE DESIGN RAINFALL (IN)	DIRECT RUNOFF ACCUMULATIVE (IN)	DIRECT RUNOFF INCREMENTAL (IN)	INCREMENTAL LOSS (IN)
	0.10	0.20	0.20	0.00	0.00	0.00
	0.20	0.20	0.40	0.00	0.00	0.00
	0.30	0.20	0.60	0.03	0.00	0.03
	0.40	0.20	0.80	0.09	0.06	0.14
	0.50	0.20	1.00	0.17	0.08	0.12
	0.60	0.20	1.20	0.28	0.11	0.09
	0.70	0.20	1.40	0.39	0.11	0.09
	0.80	0.20	1.60	0.52	0.13	0.07
	0.90	0.20	1.80	0.65	0.13	0.07
2.0	1.00	0.20	2.00	0.80	0.15	0.05
	1.10	0.24	2.24	0.98	0.18	0.06
	1.20	0.24	2.48	1.16	0.18	0.06
	1.30	0.24	2.72	1.36	0.20	0.04
	1.40	0.24	2.96	1.56	0.20	0.04
	1.50	0.24	3.20	1.76	0.20	0.04
	1.60	0.24	3.44	1.97	0.21	0.03
	1.70	0.24	3.68	2.18	0.21	0.03
	1.80	0.24	3.92	2.39	0.21	0.03
	1.90	0.24	4.16	2.60	0.21	0.03
2.4	2.00	0.24	4.40	2.82	0.22	0.02
	2.10	0.30	4.70	3.10	0.28	0.02
	2.20	0.30	5.00	3.37	0.27	0.03
	2.30	0.30	5.30	3.65	0.28	0.02
	2.40	0.30	5.60	3.93	0.28	0.02
	2.50	0.30	5.90	4.21	0.28	0.02
	2.60	0.30	6.20	4.50	0.27	0.01*
	2.70	0.30	6.50	4.78	0.29	0.01
	2.80	0.30	6.80	5.07	0.29	0.01
	2.90	0.30	7.10	5.35	0.29	0.01
3.0	3.00	0.30	7.40	5.64	0.29	0.01

* MINIMUM LOSS RATE = 0.12"/HR = 0.012"/.1HR SAY 0.01"/.1HR
(AFTER THIS RATE IS REACHED, ABANDON CURVE FOR CONSTANT LOSS)

ECI-4 ENGINEERING CONSULTANTS, INC.

NEW JERSEY DAM SAFETY INSPECTION - (DEP) SHEET NO. 2 OF 2
PMF DERIVATION - POST BROOK & IRISH BROOK JOB NO. 1212-001-1
DIRECT RUNOFF BY KLB DATE 7-28-

DIRECT RUNOFF INCREMENTS FOR COMPUTING - PMF

TIME ENDING (HR)	INCREMENTAL DESIGN RAINFALL (IN)	ACCUMULATIVE DESIGN RAINFALL (IN)	DIRECT RUNOFF ACCUMULATIVE (IN)	DIRECT RUNOFF INCREMENTAL (IN)	INCREMENTAL LOSS (IN)
3.10	0.75	8.15	6.36	0.74	0.01
3.20	0.75	8.90	7.09	0.74	0.01
3.30	0.75	9.65	7.82	0.74	0.01
3.40	0.75	10.40	8.55	0.74	0.01
3.50	0.75	11.15	9.28	0.74	0.01
3.60	0.90	12.05	10.17	0.89	0.01
3.70	0.75	12.80	10.91	0.74	0.01
3.80	0.75	13.55	11.65	0.74	0.01
3.90	0.75	14.30	12.39	0.74	0.01
4.00	0.73	15.03	13.11	0.72	0.01
4.10	0.28	15.31	13.38	0.27	0.01
4.20	0.28	15.59	13.66	0.27	0.01
4.30	0.28	15.87	13.94	0.27	0.01
4.40	0.28	16.15	14.21	0.27	0.01
4.50	0.28	16.43	14.49	0.27	0.01
4.60	0.28	16.71	15.00	0.27	0.01
4.70	0.28	16.99	15.05	0.27	0.01
4.80	0.28	17.27	15.32	0.27	0.01
4.90	0.28	17.55	15.84	0.27	0.01
5.00	0.28	17.83	15.88	0.27	0.01
5.10	0.22	18.05	16.10	0.21	0.01
5.20	0.22	18.27	16.32	0.21	0.01
5.30	0.27	18.49	16.53	0.21	0.01
5.40	0.22	18.71	16.75	0.21	0.01
5.50	0.22	18.99	17.03	0.21	0.01
5.60	0.22	19.15	17.19	0.21	0.01
5.70	0.22	19.37	17.41	0.21	0.01
5.80	0.22	19.59	17.63	0.21	0.01
5.90	0.22	19.81	17.84	0.21	0.01
6.00	0.22	20.03	17.06	0.21	0.01

* MINIMUM LOSS RATE = 0.12"/HR = 0.012"/.1 HR SAY 0.01"/.1HR
(AFTER THIS RATE IS REACHED, ARAMSON CURVE FOR CONSTANT LOSSES)

HEC-1 - COMPUTATIONS

ENGINEERING CONSULTANTS, INC.

NEW JERSEY (STATE) DAM SAFETY INSPECTION SHEET NO. 1 OF
POST BROOK AND IRISH BROOK DAMS JOB NO. 1212-001-1
INPUT TO HEC-1 BY KLB DATE 9-21-78

INPUT TO HEC-1

#	ELEV (FT)	HEAD ON SPILLWAY CREST (FT)	POST BROOK DAM DISCHARGE (CFS)	IRISH BROOK DAM DISCHARGE (CFS)	Y2 STORAGE (A.C.-FT)	Y3 TOTAL DISCHARGE (CFS)
1	267.9 (SPILLWAY CREST)	0.0	—	0.	990	0.
2	268.1 (SPILLWAY CREST)	0.2	0	3.5	1005	3.5
3	269.0	1.1	27.3	45.0	1057	72.3
4	269.5	1.6	80.0	120.0	1100	200.0
5	269.9	2.0	88.0	230.0	1125	318.0
6	270.0 (TOP OF DAM)	2.1	89.0	238.6	1137	327.6
7	270.1	2.2	200.0	360.0	1148	560.0
8	270.5	2.6	500.0	700.0	1170	1200.0
9	272.0	4.1	2989.0	2703.8	1280	5692.8
10	276.0	8.1	15170.0	12300.0	1595	27470.0

HEC-1 VERSION DATED JAN 1973

DAM SAFETY INSPECTION - NEW JERSEY STATE
POST BROOK AND IRISH BROOK DAMS 3 AND 4
PMF FLOOD ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	6	0	0	0	0	0	0	0

JOPER NWT
3 0

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	3.70	0.00	3.70	0.00	0.000	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
60	0.00	0.00	0.00

PRECIP PATTERN

0.00	0.00	0.00	0.06	0.06	0.11	0.11	0.13	0.13	0.15
0.18	0.18	0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.22
0.26	0.27	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29
0.74	0.74	0.74	0.74	0.74	0.89	0.74	0.74	0.74	0.74
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOR	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIVEN UNIT GRAPH, NUHGG= 29

0.	220.	640.	1400.	2380.	3000.	3142.	2800.	2380.	1890.
1620.	1100.	860.	670.	520.	409.	365.	230.	180.	140.
110.	90.	75.	55.	40.	35.	15.	10.	5.	

UNIT GRAPH TOTALS 24112. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.50 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.00	0.00	0.
2	0.00	0.00	0.
3	0.00	0.00	0.

1901 SOUTH NAVAJO, DENVER, COLORADO 80223

4	0.06	0.06	0.
5	0.08	0.08	13.
6	0.11	0.11	96.
7	0.11	0.11	159.
8	0.13	0.13	349.
9	0.13	0.13	623.
10	0.15	0.15	956.
11	0.18	0.18	1309.
12	0.18	0.18	1669.
13	0.20	0.20	2021.
14	0.20	0.20	2372.
15	0.20	0.20	2724.
16	0.21	0.21	3068.
17	0.21	0.21	3397.
18	0.21	0.21	3693.
19	0.21	0.21	3956.
20	0.22	0.22	4180.
21	0.28	0.28	4370.
22	0.27	0.27	4544.
23	0.28	0.28	4717.
24	0.28	0.28	4918.
25	0.28	0.28	5160.
26	0.29	0.29	5420.
27	0.29	0.29	5678.
28	0.29	0.29	5910.
29	0.29	0.29	6116.
30	0.29	0.29	6292.
31	0.74	0.74	6439.
32	0.74	0.74	6660.
33	0.74	0.74	7047.
34	0.74	0.74	7755.
35	0.74	0.74	8887.
36	0.89	0.89	10283.
37	0.74	0.74	11765.
38	0.74	0.74	13115.
39	0.74	0.74	14321.
40	0.74	0.74	15334.
41	0.27	0.27	16079.
42	0.27	0.27	16501.
43	0.27	0.27	16544.
44	0.27	0.27	16130.
45	0.27	0.27	15176.
46	0.27	0.27	13881.
47	0.27	0.27	12495.
48	0.27	0.27	11248.
49	0.27	0.27	10183.
50	0.27	0.27	9336.
51	0.21	0.21	8703.
52	0.21	0.21	8199.
53	0.21	0.21	7779.
54	0.21	0.21	7397.
55	0.21	0.21	7022.
56	0.21	0.21	6659.
57	0.21	0.21	6330.
58	0.21	0.21	6056.
59	0.21	0.21	5828.
60	0.21	0.21	5647.
61	0.00	0.00	5505.
62	0.00	0.00	5349.
63	0.00	0.00	5127.
64	0.00	0.00	4766.

65	0.00	0.00	4216.
66	0.00	0.00	3550.
67	0.00	0.00	2865.
68	0.00	0.00	2258.
69	0.00	0.00	1745.
70	0.00	0.00	1340.
71	0.00	0.00	1035.
72	0.00	0.00	798.
73	0.00	0.00	613.
74	0.00	0.00	469.
75	0.00	0.00	358.
76	0.00	0.00	271.
77	0.00	0.00	206.
78	0.00	0.00	157.
79	0.00	0.00	119.
80	0.00	0.00	90.
81	0.00	0.00	66.
82	0.00	0.00	47.
83	0.00	0.00	31.
84	0.00	0.00	19.
85	0.00	0.00	11.
86	0.00	0.00	6.
87	0.00	0.00	3.
88	0.00	0.00	1.
89	0.00	0.00	0.
90	0.00	0.00	0.
91	0.00	0.00	0.
92	0.00	0.00	0.
93	0.00	0.00	0.
94	0.00	0.00	0.
95	0.00	0.00	0.
96	0.00	0.00	0.
97	0.00	0.00	0.
98	0.00	0.00	0.
99	0.00	0.00	0.
100	0.00	0.00	0.
101	0.00	0.00	0.
102	0.00	0.00	0.
103	0.00	0.00	0.
104	0.00	0.00	0.
105	0.00	0.00	0.
106	0.00	0.00	0.
107	0.00	0.00	0.
108	0.00	0.00	0.
109	0.00	0.00	0.
110	0.00	0.00	0.
111	0.00	0.00	0.
112	0.00	0.00	0.
113	0.00	0.00	0.
114	0.00	0.00	0.
115	0.00	0.00	0.
116	0.00	0.00	0.
117	0.00	0.00	0.
118	0.00	0.00	0.
119	0.00	0.00	0.
120	0.00	0.00	0.
121	0.00	0.00	0.
122	0.00	0.00	0.
123	0.00	0.00	0.
124	0.00	0.00	0.
125	0.00	0.00	0.

126	0.00	0.00	0.
127	0.00	0.00	0.
128	0.00	0.00	0.
129	0.00	0.00	0.
130	0.00	0.00	0.
131	0.00	0.00	0.
132	0.00	0.00	0.
133	0.00	0.00	0.
134	0.00	0.00	0.
135	0.00	0.00	0.
136	0.00	0.00	0.
137	0.00	0.00	0.
138	0.00	0.00	0.
139	0.00	0.00	0.
140	0.00	0.00	0.
141	0.00	0.00	0.
142	0.00	0.00	0.
143	0.00	0.00	0.
144	0.00	0.00	0.
145	0.00	0.00	0.
146	0.00	0.00	0.
147	0.00	0.00	0.
148	0.00	0.00	0.
149	0.00	0.00	0.
150	0.00	0.00	0.
SUM	17.98	17.98	433535.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	14544.	7117.	2890.	2890.	433531.
INCHES		17.89	18.16	18.16	18.16
AC-FT		3531.	3584.	3584.	3584.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU POST BROOK DAMS 3 AND 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.000	0.000	0.000	-1.

STORAGE=	990.	1005.	1057.	1100.	1125.	1137.	1148.	1170.	1280.	1595.
OUTFLOW=	0.	8.	72.	200.	318.	527.	560.	1200.	5692.	27470.

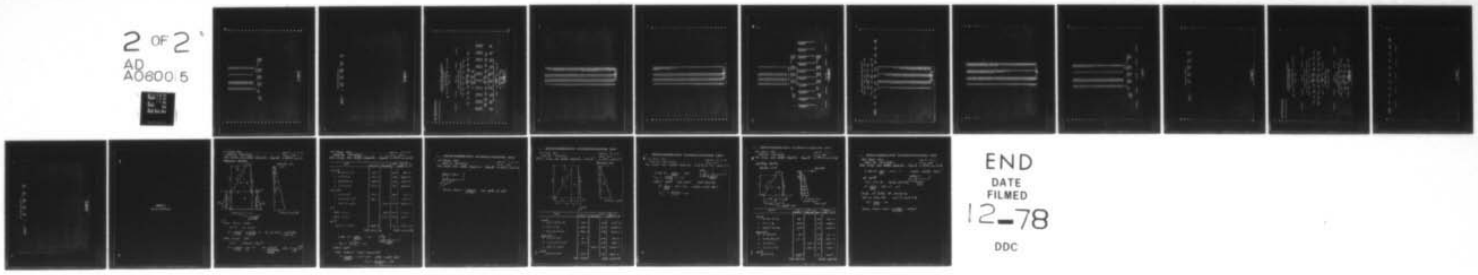
TIME	EOP STOR	AVG IN	EOP OUT
1	990.	0.	0.
2	990.	0.	0.
3	990.	0.	0.
4	990.	0.	0.
5	990.	0.	0.
6	990.	0.	0.

7	991.	107.	0.
8	993.	254.	0.
9	997.	486.	1.
10	1003.	789.	3.
11	1015.	1132.	14.
12	1025.	1489.	30.
13	1040.	1845.	50.
14	1057.	2197.	74.
15	1078.	2548.	134.
16	1100.	2896.	202.
17	1125.	3232.	318.
18	1150.	3545.	632.
19	1173.	3825.	1358.
20	1193.	4068.	2141.
21	1208.	4275.	2757.
22	1220.	4457.	3248.
23	1229.	4631.	3647.
24	1238.	4817.	3985.
25	1245.	5039.	4290.
26	1252.	5290.	4578.
27	1259.	5549.	4859.
28	1266.	5794.	5129.
29	1272.	6013.	5384.
30	1278.	6204.	5621.
31	1283.	6366.	5914.
32	1287.	6550.	6196.
33	1291.	6854.	6488.
34	1297.	7401.	6894.
35	1306.	8321.	7528.
36	1319.	9585.	8442.
37	1536.	11024.	9590.
38	1354.	12440.	10656.
39	1373.	13718.	12128.
40	1390.	14827.	13328.
41	1405.	15706.	14385.
42	1417.	16290.	15231.
43	1426.	16522.	15805.
44	1429.	16337.	16041.
45	1427.	15653.	15869.
46	1418.	14528.	15273.
47	1405.	13188.	14347.
48	1389.	11872.	13247.
49	1373.	10716.	12122.
50	1357.	9760.	11072.
51	1344.	9020.	10160.
52	1333.	8451.	9400.
53	1324.	7989.	8773.
54	1316.	7588.	8246.
55	1310.	7209.	7786.
56	1304.	6840.	7366.
57	1298.	6495.	6978.
58	1293.	6193.	6630.
59	1289.	5942.	6324.
60	1285.	5737.	6063.
61	1282.	5576.	5847.
62	1279.	5457.	5672.
63	1276.	5358.	5546.
64	1272.	4947.	5373.
65	1265.	4491.	5118.
66	1257.	3883.	4752.
67	1246.	[illegible]	4318.

68	1233.	2561.	3807.
69	1221.	2002.	3286.
70	1208.	1543.	2782.
71	1197.	1187.	2822.
72	1187.	917.	1916.
73	1178.	706.	1566.
74	1171.	541.	1270.
75	1165.	413.	1068.
76	1159.	314.	906.
77	1154.	239.	763.
78	1150.	182.	638.
79	1146.	138.	538.
80	1143.	104.	469.
81	1140.	78.	406.
82	1138.	56.	350.
83	1135.	39.	326.
84	1133.	25.	324.
85	1130.	15.	322.
86	1127.	8.	320.
87	1125.	4.	318.
88	1122.	2.	307.
89	1120.	0.	295.
90	1117.	0.	284.
91	1115.	0.	273.
92	1113.	0.	263.
93	1111.	0.	253.
94	1109.	0.	243.
95	1107.	0.	234.
96	1105.	0.	225.
97	1103.	0.	216.
98	1101.	0.	208.
99	1100.	0.	200.
100	1098.	0.	195.
101	1096.	0.	190.
102	1095.	0.	186.
103	1093.	0.	181.
104	1092.	0.	177.
105	1090.	0.	172.
106	1089.	0.	168.
107	1088.	0.	164.
108	1086.	0.	160.
109	1085.	0.	156.
110	1084.	0.	152.
111	1082.	0.	149.
112	1081.	0.	145.
113	1080.	0.	141.
114	1079.	0.	138.
115	1078.	0.	135.
116	1077.	0.	131.
117	1075.	0.	128.
118	1074.	0.	125.
119	1073.	0.	122.
120	1072.	0.	119.
121	1071.	0.	116.
122	1070.	0.	113.
123	1070.	0.	111.
124	1069.	0.	108.
125	1068.	0.	105.
126	1067.	0.	103.
127	1066.	0.	100.
128	1065.	0.	98.

AD-A060 015 HARRIS ECI ASSOCIATES WOODBRIDGE NJ F/G 13/2
NATIONAL DAM SAFETY PROGRAM. POST BROOK DAM (NJ00220), PASSAIC --ETC(U)
AUG 78 R GERSHOWITZ DACW61-78-C-0124
UNCLASSIFIED NL

2 OF 2
AD
A060015



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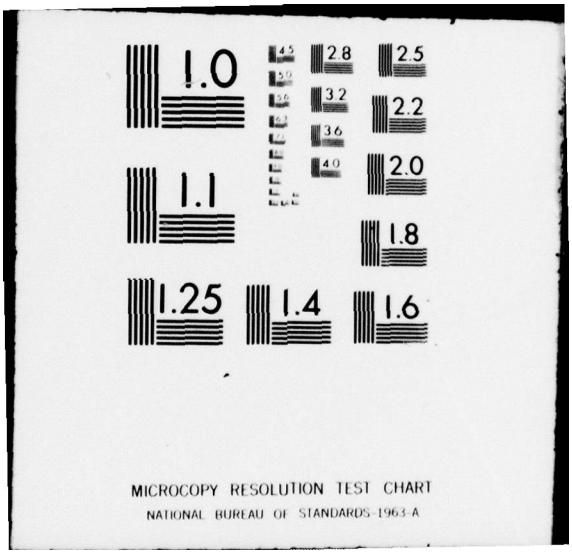
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

129	1064.	0.	95.	
130	1064.	0.	93.	
131	1063.	0.	91.	
132	1062.	0.	89.	
133	1061.	0.	86.	
134	1061.	0.	84.	
135	1060.	0.	82.	
136	1059.	0.	80.	
137	1059.	0.	78.	
138	1058.	0.	76.	
139	1057.	0.	75.	
140	1057.	0.	73.	
141	1056.	0.	71.	
142	1056.	0.	71.	
143	1055.	0.	70.	
144	1054.	0.	69.	
145	1054.	0.	66.	
146	1053.	0.	68.	
147	1053.	0.	67.	
148	1052.	0.	66.	
149	1052.	0.	65.	
150	1051.	0.	65.	
SUM			426106.	

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16041.	6874.	2840.	2840.	426106.
INCHES		17.28	17.85	17.85	17.85
AC-FT		3410.	3523.	3523.	3523.

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	3	16544.	7117.	2890.	2890.	3.70
ROUTED TO	3	16041.	6874.	2840.	2840.	3.70

HEC-1 VERSION DATED JAN 1973

DAM SAFETY INSPECTION - NEW JERSEY STATE
POST BROOK AND IRISH BROOK DAMS 3 AND 4
ONE HALF PMF FLOOD ROUTING

JOB SPECIFICATION

NW	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	6	0	0	0	0	0	0	0

JOPER	NWT
3	0

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
5	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	3.70	0.00	3.70	0.00	0.900	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAM
60	0.00	0.00	0.00

PRECIP PATTERN

0.00	0.00	0.00	0.06	0.08	0.11	0.11	0.13	0.13	0.15
0.18	0.18	0.20	0.20	0.20	0.21	0.21	0.21	0.21	0.22
0.28	0.27	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29
0.74	0.74	0.74	0.74	0.74	0.89	0.74	0.74	0.74	0.74
0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIVEN UNIT GRAPH, NUHGG= 29

0.	220.	640.	1400.	2380.	3000.	3142.	2800.	2380.	1890.
1420.	1100.	860.	670.	520.	405.	305.	230.	180.	140.
115.	90.	75.	55.	40.	25.	15.	10.	5.	

UNIT GRAPH TOTALS 24112. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.00	0.00	0.
2	0.00	0.00	0.
3	0.00	0.00	0.

4	0.06	0.06	0.
5	0.08	0.08	13.
6	0.11	0.11	56.
7	0.11	0.11	159.
8	0.13	0.13	349.
9	0.13	0.13	623.
10	0.15	0.15	956.
11	0.18	0.18	1309.
12	0.18	0.18	1669.
13	0.20	0.20	2021.
14	0.20	0.20	2372.
15	0.20	0.20	2724.
16	0.21	0.21	3068.
17	0.21	0.21	3397.
18	0.21	0.21	3693.
19	0.21	0.21	3956.
20	0.22	0.22	4180.
21	0.28	0.28	4370.
22	0.27	0.27	4544.
23	0.28	0.28	4717.
24	0.28	0.28	4918.
25	0.28	0.28	5160.
26	0.29	0.29	5420.
27	0.29	0.29	5678.
28	0.29	0.29	5910.
29	0.29	0.29	6116.
30	0.29	0.29	6292.
31	0.74	0.74	6439.
32	0.74	0.74	6660.
33	0.74	0.74	7047.
34	0.74	0.74	7755.
35	0.74	0.74	8887.
36	0.89	0.89	10283.
37	0.74	0.74	11765.
38	0.74	0.74	13115.
39	0.74	0.74	14321.
40	0.74	0.74	15334.
41	0.27	0.27	16079.
42	0.27	0.27	16501.
43	0.27	0.27	16544.
44	0.27	0.27	16130.
45	0.27	0.27	15176.
46	0.27	0.27	13861.
47	0.27	0.27	12495.
48	0.27	0.27	11248.
49	0.27	0.27	10183.
50	0.27	0.27	9336.
51	0.21	0.21	8703.
52	0.21	0.21	8199.
53	0.21	0.21	7779.
54	0.21	0.21	7397.
55	0.21	0.21	7022.
56	0.21	0.21	6659.
57	0.21	0.21	6330.
58	0.21	0.21	6056.
59	0.21	0.21	5828.
60	0.21	0.21	5647.
61	0.00	0.00	5505.
62	0.00	0.00	5389.
63	0.00	0.00	5127.
64	0.00	0.00	4766.

65	0.00	0.00	4216.
66	0.00	0.00	3550.
67	0.00	0.00	2865.
68	0.00	0.00	2256.
69	0.00	0.00	1745.
70	0.00	0.00	1340.
71	0.00	0.00	1035.
72	0.00	0.00	798.
73	0.00	0.00	613.
74	0.00	0.00	469.
75	0.00	0.00	358.
76	0.00	0.00	271.
77	0.00	0.00	206.
78	0.00	0.00	157.
79	0.00	0.00	119.
80	0.00	0.00	90.
81	0.00	0.00	66.
82	0.00	0.00	47.
83	0.00	0.00	31.
84	0.00	0.00	19.
85	0.00	0.00	11.
86	0.00	0.00	6.
87	0.00	0.00	3.
88	0.00	0.00	1.
89	0.00	0.00	0.
90	0.00	0.00	0.
91	0.00	0.00	0.
92	0.00	0.00	0.
93	0.00	0.00	0.
94	0.00	0.00	0.
95	0.00	0.00	0.
96	0.00	0.00	0.
97	0.00	0.00	0.
98	0.00	0.00	0.
99	0.00	0.00	0.
100	0.00	0.00	0.
101	0.00	0.00	0.
102	0.00	0.00	0.
103	0.00	0.00	0.
104	0.00	0.00	0.
105	0.00	0.00	0.
106	0.00	0.00	0.
107	0.00	0.00	0.
108	0.00	0.00	0.
109	0.00	0.00	0.
110	0.00	0.00	0.
111	0.00	0.00	0.
112	0.00	0.00	0.
113	0.00	0.00	0.
114	0.00	0.00	0.
115	0.00	0.00	0.
116	0.00	0.00	0.
117	0.00	0.00	0.
118	0.00	0.00	0.
119	0.00	0.00	0.
120	0.00	0.00	0.
121	0.00	0.00	0.
122	0.00	0.00	0.
123	0.00	0.00	0.
124	0.00	0.00	0.
125	0.00	0.00	0.

126	0.00	0.00	0.
127	0.00	0.00	0.
128	0.00	0.00	0.
129	0.00	0.00	0.
130	0.00	0.00	0.
131	0.00	0.00	0.
132	0.00	0.00	0.
133	0.00	0.00	0.
134	0.00	0.00	0.
135	0.00	0.00	0.
136	0.00	0.00	0.
137	0.00	0.00	0.
138	0.00	0.00	0.
139	0.00	0.00	0.
140	0.00	0.00	0.
141	0.00	0.00	0.
142	0.00	0.00	0.
143	0.00	0.00	0.
144	0.00	0.00	0.
145	0.00	0.00	0.
146	0.00	0.00	0.
147	0.00	0.00	0.
148	0.00	0.00	0.
149	0.00	0.00	0.
150	0.00	0.00	0.
SUM	17.98	17.98	433535.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16544.	7117.	2890.	2890.	433531.
INCHES		17.89	18.16	18.16	18.16
AC-FT		3531.	3584.	3584.	3584.

RUNOFF MULTIPLIED BY 0.50

0.	0.	0.	0.	6.	28.	79.	174.	311.	478.
654.	834.	1010.	1186.	1362.	1534.	1698.	1846.	1978.	2090.
2185.	2272.	2358.	2459.	2580.	2710.	2839.	2955.	3058.	3146.
3219.	3330.	3523.	3877.	4443.	5141.	5882.	6557.	7160.	7667.
8039.	8250.	8272.	8065.	7588.	6940.	6247.	5624.	5091.	4668.
4351.	4099.	3889.	3698.	3511.	3329.	3165.	3028.	2914.	2823.
2752.	2674.	2563.	2383.	2108.	1775.	1432.	1129.	872.	670.
517.	399.	306.	234.	179.	135.	103.	78.	59.	45.
33.	23.	15.	9.	5.	3.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8272.	3558.	1445.	1445.	216765.
INCHES		8.94	9.08	9.08	9.08
AC-FT		1765.	1792.	1792.	1792.

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HYDROGRAPH ENDING

ROUTE HYDROGRAPH THRU POST BROOK DAMS 3 AND 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.000	0.000	0.000	-1.

STORAGE=	990.	1005.	1057.	1100.	1125.	1137.	1148.	1170.	1280.	1595.
OUTFLOW=	0.	3.	72.	200.	318.	327.	560.	1200.	5692.	27470.

TIME	EOP STOR	AVG IN	EOP OUT
1	990.	0.	0.
2	990.	0.	0.
3	990.	0.	0.
4	990.	0.	0.
5	990.	3.	0.
6	990.	17.	0.
7	990.	53.	0.
8	991.	127.	0.
9	993.	243.	0.
10	996.	394.	1.
11	1001.	566.	2.
12	1007.	744.	7.
13	1015.	922.	17.
14	1024.	1098.	28.
15	1034.	1274.	42.
16	1045.	1448.	57.
17	1058.	1616.	77.
18	1072.	1772.	118.
19	1087.	1912.	161.
20	1102.	2034.	211.
21	1118.	2137.	285.
22	1133.	2228.	325.
23	1149.	2315.	597.
24	1162.	2408.	986.
25	1173.	2519.	1355.
26	1182.	2645.	1727.
27	1190.	2774.	2030.
28	1196.	2897.	2280.
29	1201.	3006.	2490.
30	1205.	3102.	2667.
31	1209.	3183.	2816.
32	1212.	3275.	2948.
33	1216.	3427.	3086.
34	1220.	3700.	3264.
35	1226.	4160.	3523.
36	1235.	4792.	3889.
37	1247.	5512.	4358.
38	1260.	6220.	4896.
39	1274.	6859.	5463.
40	1287.	7413.	6006.
41	1298.	7883.	6930.
42	1305.	8145.	7474.
43	1310.	8261.	7824.
44	1313.	8158.	7977.
45	1316.	[illegible]	7910.

46	1307.	7444.	7823.
47	1301.	6894.	7168.
48	1295.	5936.	6619.
49	1285.	5358.	6058.
50	1277.	4880.	5590.
51	1269.	4510.	5078.
52	1262.	4225.	4974.
53	1255.	3994.	4691.
54	1249.	3794.	4432.
55	1243.	3604.	4193.
56	1237.	3420.	3970.
57	1232.	3247.	3761.
58	1228.	3096.	3569.
59	1223.	2971.	3396.
60	1220.	2868.	3244.
61	1216.	2788.	3112.
62	1214.	2713.	2997.
63	1211.	2619.	2886.
64	1208.	2473.	2764.
65	1204.	2245.	2617.
66	1199.	1941.	2422.
67	1196.	1603.	2185.
68	1187.	1280.	1924.
69	1181.	1001.	1657.
70	1174.	771.	1401.
71	1169.	593.	1176.
72	1163.	458.	1002.
73	1158.	353.	876.
74	1154.	270.	748.
75	1150.	206.	632.
76	1146.	157.	537.
77	1143.	119.	470.
78	1140.	91.	409.
79	1136.	69.	358.
80	1135.	52.	326.
81	1133.	39.	324.
82	1131.	28.	322.
83	1128.	19.	320.
84	1126.	12.	318.
85	1125.	7.	311.
86	1121.	4.	299.
87	1118.	2.	287.
88	1116.	1.	276.
89	1114.	0.	266.
90	1111.	0.	256.
91	1109.	0.	246.
92	1107.	0.	236.
93	1105.	0.	227.
94	1104.	0.	219.
95	1102.	0.	210.
96	1100.	0.	202.
97	1098.	0.	196.
98	1097.	0.	190.
99	1095.	0.	187.
100	1094.	0.	182.
101	1092.	0.	178.
102	1091.	0.	174.
103	1089.	0.	169.
104	1088.	0.	165.
105	1087.	0.	161.
106	1085.	0.	157.

107	1084.	0.	153.
108	1083.	0.	150.
109	1082.	0.	146.
110	1080.	0.	143.
111	1079.	0.	139.
112	1078.	0.	136.
113	1077.	0.	132.
114	1076.	0.	129.
115	1075.	0.	126.
116	1074.	0.	123.
117	1073.	0.	120.
118	1072.	0.	117.
119	1071.	0.	114.
120	1070.	0.	111.
121	1069.	0.	109.
122	1068.	0.	106.
123	1067.	0.	103.
124	1066.	0.	101.
125	1065.	0.	98.
126	1065.	0.	96.
127	1064.	0.	94.
128	1063.	0.	91.
129	1062.	0.	89.
130	1062.	0.	87.
131	1061.	0.	85.
132	1060.	0.	83.
133	1060.	0.	81.
134	1059.	0.	79.
135	1058.	0.	77.
136	1058.	0.	75.
137	1057.	0.	73.
138	1056.	0.	72.
139	1056.	0.	71.
140	1055.	0.	70.
141	1055.	0.	69.
142	1054.	0.	69.
143	1053.	0.	68.
144	1053.	0.	67.
145	1052.	0.	66.
146	1052.	0.	66.
147	1051.	0.	65.
148	1051.	0.	64.
149	1050.	0.	63.
150	1050.	0.	63.
SUM			209514.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7977.	8307.	1396.	1396.	209514.
INCHES		8.31	8.77	8.77	8.77
AC-FT		1641.	1732.	1732.	1732.

********** ********** ********** ********** **********

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	3	8272.	3558.	1445.	1445.	3.70
ROUTED TO	3	7977.	3307.	1396.	1396.	3.70

HEC-1 VERSION DATED JAN 1973

DAM SAFETY INSPECTION - NEW JERSEY STATE
POST BROOK AND IRISH BROOK DAMS 3 AND 4
PERCENT OF PMF FLOOD ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	6	0	0	0	0	0	4	0

JOPER	NWT
3	0

SUB-AREA RUNOFF COMPUTATION

INPUT UNIT HYDROGRAPH DERIVED FROM SCS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	3.70	0.00	3.70	0.00	0.060	0	0	0

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
SUM	17.98	17.98	433535.

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU POST BROOK DAMS 3 AND 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.000	0.00	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.[illegible]	0.000	0.000	-1.

STORAGE=	990.	1005.	1057.	1100.	1125.	1137.	1148.	1170.	1280.	1595.
OUTFLOW=	0.	5.	72.	200.	318.	327.	560.	1200.	5692.	27470.

********** ********** ********** ********** **********

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	3	992.	427.	173.	173.	3.70
ROUTED TO	3	323.	245.	130.	130.	3.70

APPENDIX E

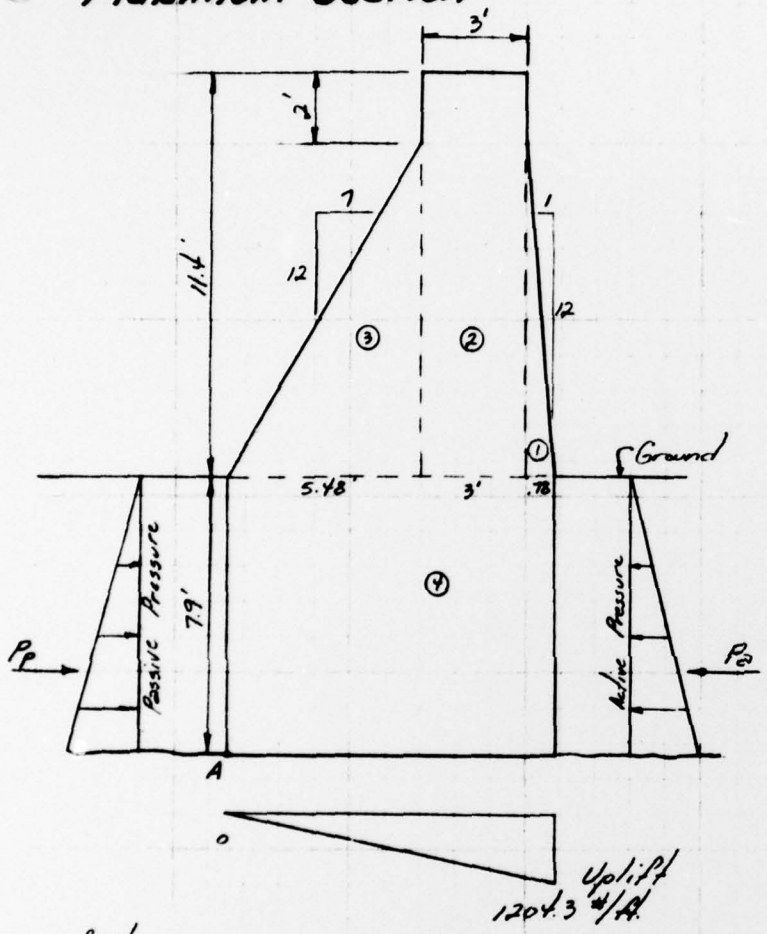
STABILITY CALCULATIONS

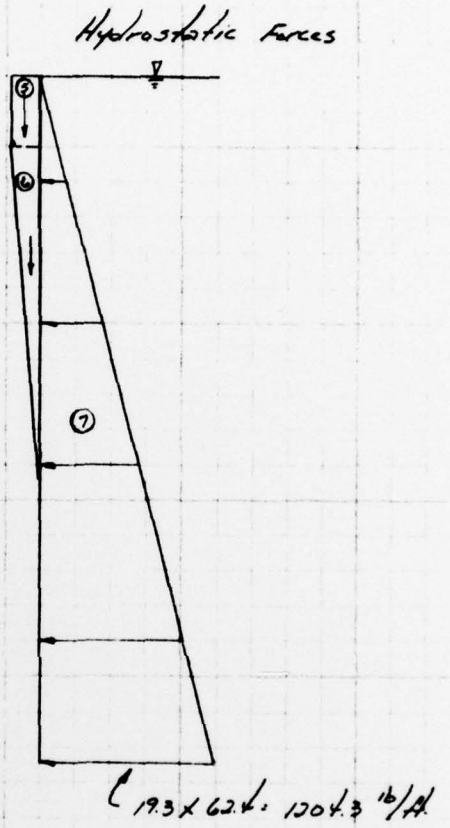
Post Brook Dam — SHEET NO. 1 OF 5

Stability Calculations — JOB NO. 1212

New Jersey Dam Safety Inspection Group II — BY M.R.H. DATE 8-10-

Maximum Section





Soil

Passive Pressure: (D/S)

$\phi = 30°$ $\gamma_T = 130$ pcf

$C_p = \frac{1+\sin\phi}{1-\sin\phi} = \frac{1+\sin(30°)}{1-\sin(30°)} = 3$ $P_p = C_p \gamma h^2/2 = 3(130)(7.9)^2/2 = 12170$ lbs.

Active Pressure: (U/S)

$\phi = 30°$ $\gamma_{submerged} = 138$ pcf

$C_a = \frac{1-\sin\phi}{1+\sin\phi} \cdot \frac{0.5}{1.5} = 1/3$ $P_a = C_a \gamma h^2/2 = 1/3(75.4)(7.9)^2/2 = 786.4$ lbs.

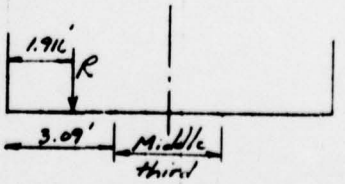
where $\gamma = 138 - 62.4$ (water) $= 75.6$

Post Brook Dam
Stability Calculations
New Jersey Dam Safety Inspection Group II

SHEET NO. 2 OF 5
JOB NO. 1212
BY M.R.H. DATE 8-10-78

Forces	Vertical	Horizontal	ARM	Moment about A ↻
Concrete				
1. .78 × 9.4 × ½ × 150	550 ↓		8.74	4807 ↻
2. 3.0 × 11.4 × 150	5130 ↓		6.98	35807.4 ↻
3 5.48 × 9.4 × ½ × 150	3863.4 ↓		3.65	14101.4 ↻
4. 7.9 × 9.26 × 150	10973.1 ↓		4.63	50805.5 ↻
Hydrostatic				
5. 2 × .78 × 62.4	97.3 ↓		8.87	863.1 ↻
6. 9.4 × .78 × ½ × 62.4	228.8 ↓		9.0	2059.2 ↻
7. 19.3 × ½ × 120.3		11621.5 ←	6.43	- 74726.2 ↺
Soil				
Active Pressure		786.4 ←	2.63	- 2068.2 ↺
Passive Pressure		12170 →	2.63	32007.1 ↻
Uplift				
9.26 × ½ × 120.3	5575.9 ↑		6.17	- 34403.3 ↺
	+↓ ΣV = 15266.7 lbs			↻ ΣM = 29253.0 ft-lb

$\bar{x}$ from A = $\frac{29253.0}{15266.7}$ = 1.916'



$FS_{ol} = \frac{140450.7}{111197.7}$ 1.26

Without Uplift

+↓ ΣV = 20843.6 lbs ↻ ΣM = 63656.3 ft-lb

$\bar{x} = \frac{63656.3}{20843.6}$ = 3.05' < 3.09' outside middle third

$FS_{s.l.} = \frac{140450.7}{76794.4} = 1.83$

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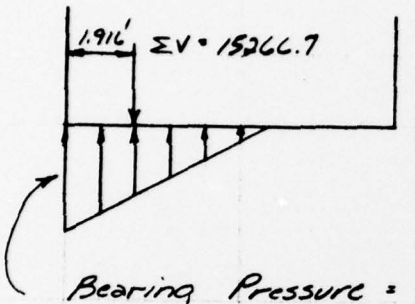
Post Brook Dam
Stability Calculations
New Jersey Dam Safety Inspection Group II

SHEET NO. 3 OF 5
JOB NO. 1212
BY M.R.H. DATE 8-10-78



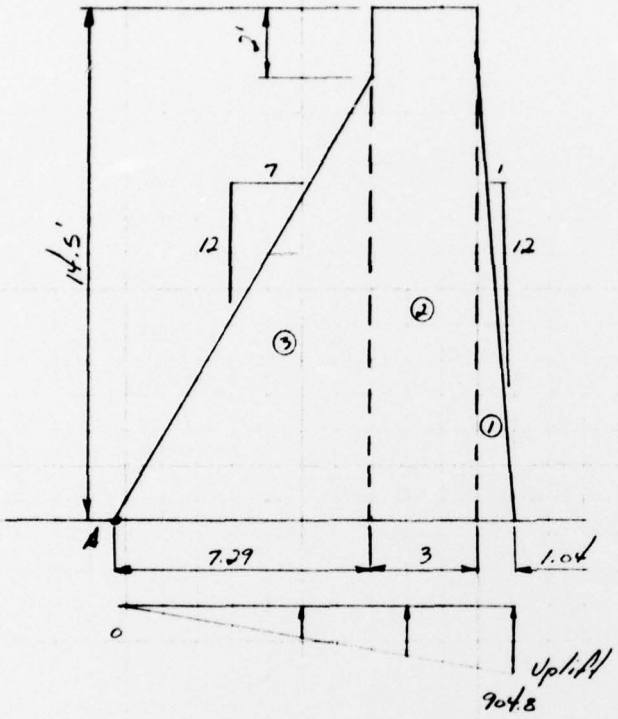
Bearing Pressure = $\frac{2(15266.7)}{3(1.916)}$ = 5312 lbs/ft (per foot)

FCI-4 **ENGINEERING CONSULTANTS, INC.**

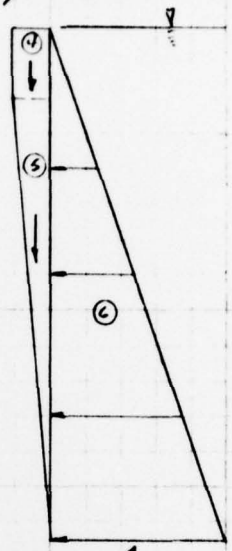
Post Brook Dam — SHEET NO. 4 OF 5

Stability Calculations — JOB NO. 1212

New Jersey Dam Safety Inspection Group II — BY M.R.H DATE 8-10-78



Hydrostatic Forces



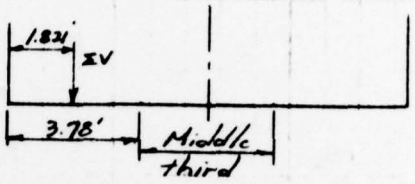
$\frac{1}{2} \times 14.5 \times 62.4 \cdot 904.8$ #/ft

Forces	Vertical	Horizontal	Arm	Moment about A ↻
Concrete				
1. $12.5 \times 1.04 \times \frac{1}{2} \times 150$	975 ↓		10.64	10374 ↻
2. $14.5 \times 3 \times 150$	6525 ↓		8.79	57355 ↻
3. $7.29 \times 12.5 \times \frac{1}{2} \times 150$	6834 ↓		4.86	33213 ↻
Hydrostatic				
4. $2 \times 1.04 \times 62.4$	130 ↓		10.81	1405 ↻
5. $12.5 \times 1.04 \times \frac{1}{2} \times 62.4$	406 ↓		10.98	4458 ↻
6. $14.5 \times \frac{1}{3} \times 904.8$		6560 ←	4.83	-31685 ↺
Uplift				
$11.33 \times \frac{1}{2} \times 904.8$	5126 ↑		7.55	-38701 ↺
	$+\downarrow \Sigma V = 19996$ #			$\circlearrowright \Sigma M = 36419$ #-ft

ECI-4 **ENGINEERING CONSULTANTS, INC.**

Post Brook Dam
Stability Calculations
New Jersey Dam Safety Inspection Group II

SHEET NO. 5 OF 5
JOB NO. 1212
BY 1212 DATE 8-10-78



$\bar{x}$ from A = $\frac{36419}{19996}$ = 1.821'

$F.S._{O.T.} = \frac{106805}{70386} = 1.52$

Without Uplift $+\downarrow \Sigma V = 25122$ # $\circlearrowright \Sigma M = 75120$ #-ft.

$\bar{x} = \frac{75120}{25122} = 2.99' < 3.78$ outside middle third

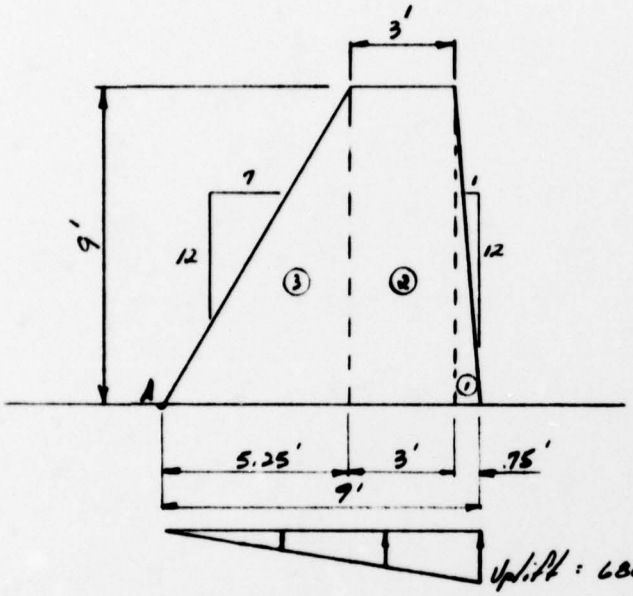
$F.S._{O.T} = \frac{106805}{31685} = 3.37$

ECI-4 ENGINEERING CONSULTANTS, INC.

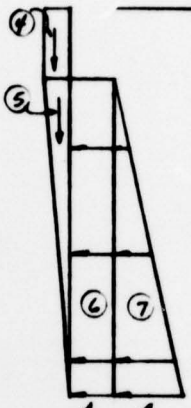
Post Brook Dam
Stability Calculations
New Jersey Dam Safety Inspection Group II

SHEET NO. 1 OF
JOB NO. 1212
BY M.R.H. DATE 9-1-78

Spillway Section
Section C-D



Hydrostatic



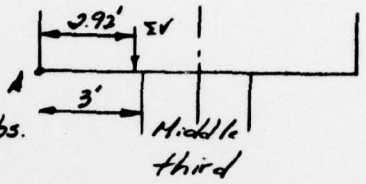
Forces	+ ↓ Vertical	← Horizontal	Arm	Moment about A (+)
Concrete				
1. 9 x .75 x 1/2 x 150	506 ↓		8.5	4301 ↻
2. 9 x 3 x 150	4050 ↓		6.75	27338 ↻
3. 5.25 x 9 x 1/2 x 150	3544 ↓		3.50	12404 ↻
Hydrostatic				
4. 2 x .75 x 62.4	94 ↓		8.63	811 ↻
5 9 x .75 x 1/2 x 62.4	211 ↓		8.75	1846 ↻
6 2 x 62.4 x 9		- 1123 ←	4.6	- 5054 ↺
7. 9 x 62.4 x 9 x 1/2		- 2527 ←	3.0	- 7581 ↺
Uplift 686.4 x 9 x 1/2	- 3087 ↑		6.0	- 18534 ↺
	+↓ ΣV = 5316 lbs.			(+) ΣM_A = 15531 ft-lbs.

ECI-4 ENGINEERING CONSULTANTS, INC.

Post Brook Dam
Stability Calculations
New Jersey Dam Safety Inspection Group II

SHEET NO. 2 OF
JOB NO. 1212
BY M.R.H. DATE 9-1-78

$\bar{x}$ from A = $\frac{15531}{5316}$ = 2.92' < 3' outside Middle third



w/o Uplift

$+\downarrow \Sigma V$ = 8405 lbs $\circlearrowright \Sigma M_A$ = 34065 #-lbs.

$\bar{x} = \frac{34065}{8405}$ = 4.05' > 3' O.K.

Factor of Safety for overturning

R.M. = R = 46700 #-ft. O.M. = O = 31169 #-ft.

F.S. = $\frac{46700}{31169}$ = 1.50

Bearing Pressure (Max.) = $\frac{2\,(5316)}{3\,(2.92)}$ = 1214 psf